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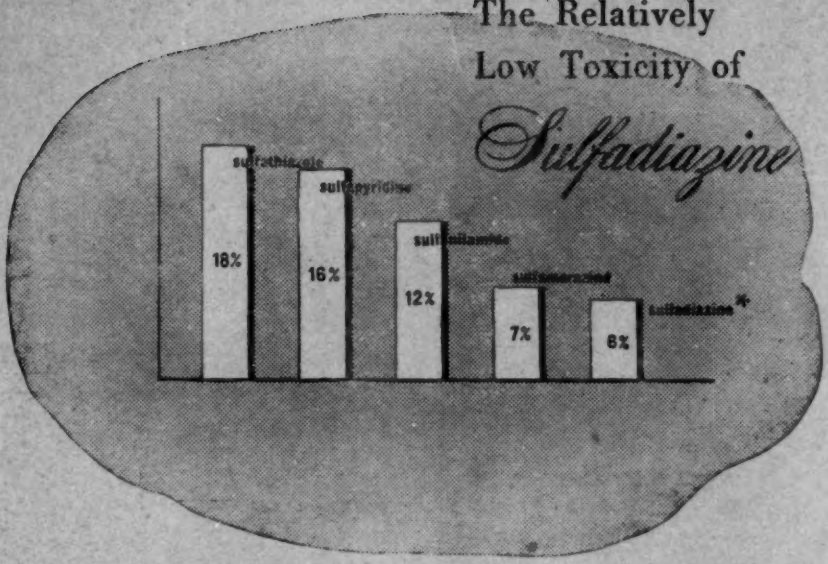

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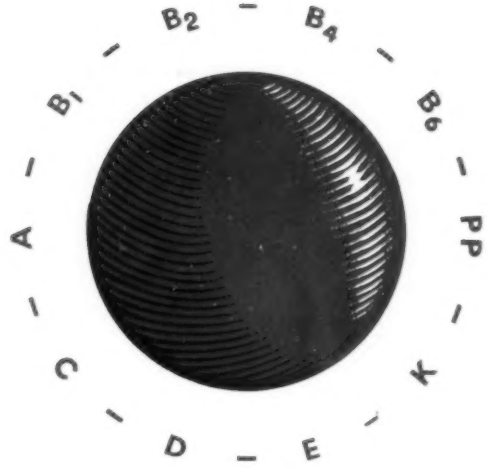

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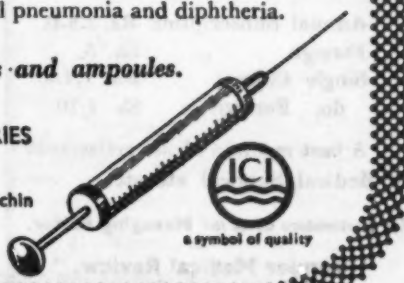

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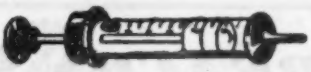

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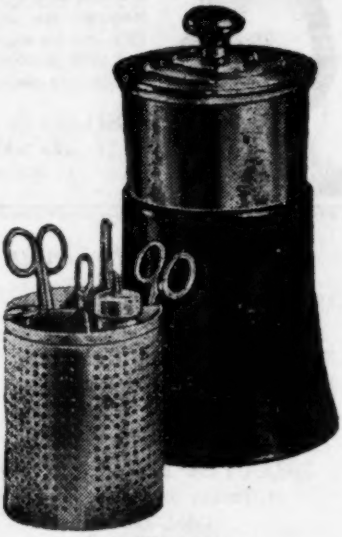

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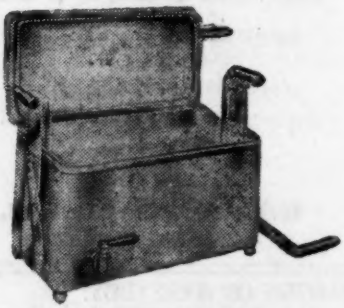

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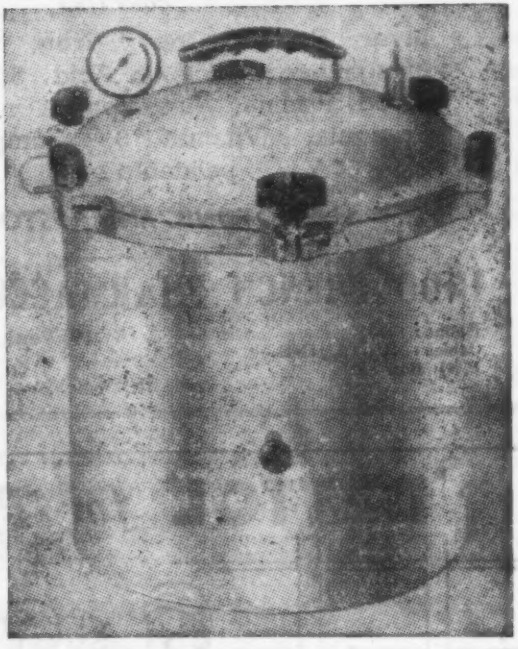

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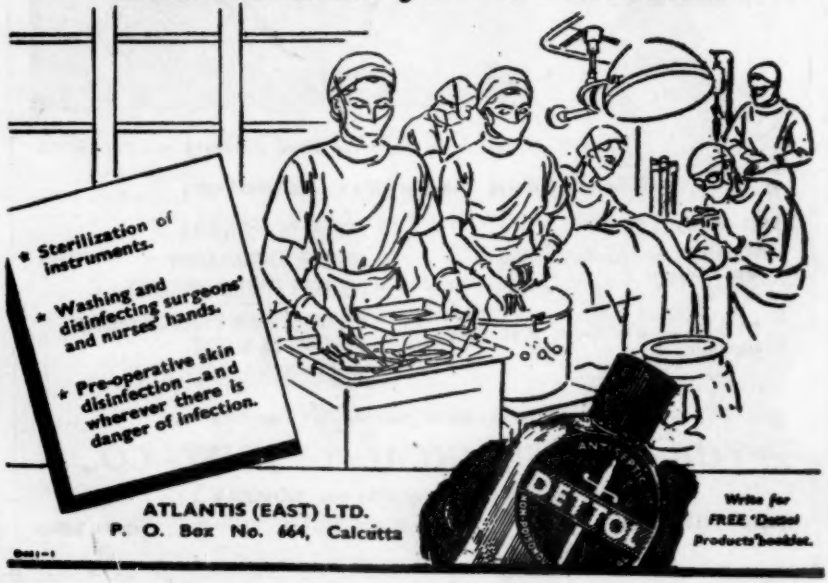
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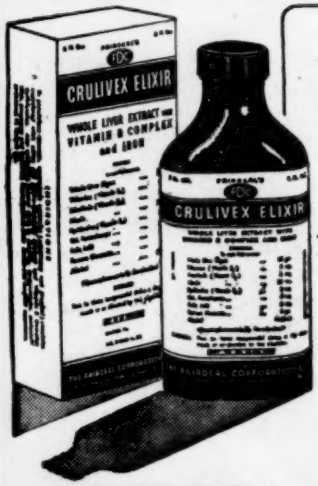

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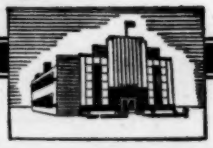

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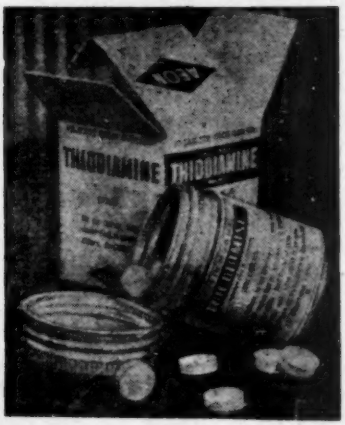

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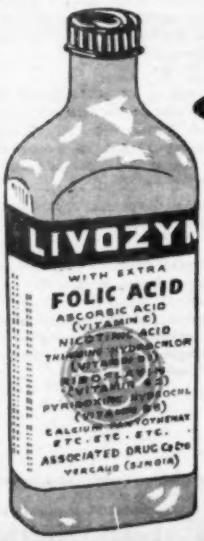

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In many illnesses, when gastric secretion is impaired and is deficient in hydrochloric acid, BOVRIL corrects this condition by restoring the normal volume and activity of the gastric juice, thus aiding the peptic digestion and absorption of protein foods.

BOVRIL is rich in protein, and is also specially valuable because of its high vitamin "B" content—two or three cups of BOVRIL supply the full adult daily requirement for nicotinic acid, and a not inconsiderable proportion of the riboflavin requirement, these being the principal substances comprised in the vitamin "B2" complex.

Intensive study of the nutritive value of meat extracts made during the recent war by both British and German chemists, shows that meat extracts have a much higher nutritive value than was previously thought, while other independent tests have demonstrated that BOVRIL promotes a greater flow of gastric juices than any of the other gastric stumulants used in the tests.

BOVRIL is also rich in Sodium Glutamate, a protein component which has the unique property of enhancing the natural flavours of foods with which it is incorporated. Thus, apart from its own most attractive and intense flavour, BOVRIL brings out the natural flavours of other foods, and it is to that extent a new-style condiment.

Everyone, therefore, who is run down through strain or illness, or who feels in need of extra strength to cope with the demands of modern life, should take a cup of hot Bovril daily. It is a delicious and stimulating way of keeping fit and strong.

BOVRIL *assists assimilation*

BE 42d

FEROSAN TABLETS

FERROUS SULPHATE COMPOUND

A stable and convenient preparation of ferrous sulphate, with traces of copper and manganese. One tablet of FEROSAN contains 3 gr. of ferrous sulphate, and is therapeutically equivalent to approximately 15 gr. Blaud's pill. FEROSAN TABLETS are indicated in the treatment of hypochromic anæmias, as a prophylactic during pregnancy and as a general tonic.

Bottles of 100 and 500 tablets

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BOOTS PURE DRUG COMPANY (INDIA) LTD.

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Manufactured by:

BOOTS PURE DRUG CO., LTD. NOTTINGHAM, ENGLAND

M/20A

B-FOLIN

BRAND

Folic acid with Liver and Vitamin B - Complex

Each tablet contains :

Folic Acid Conc.	..	5	M. Gms.
Vit. B_1	..	5	,,
Vit. B_2	..	1	M. Gm
Vit. B_6	..	0·2	,,
Nicotinic Acid	..	20	M. Gms.
Liver Conc.	..	45	,,

Indicated in all types of Macrocytic anaemia, Vit. B Deficiency and Sprue.

The Folic acid concentrate which is added to this product is obtained from fresh liver. The concentrate contains Folic Acid in the free as well as in the conjugated forms. In addition to this, the Folic Acid concentrate is also rich in all the other compounds of the Pterine class which play an important role in blood regeneration.

The Liver extract fraction is extremely rich in the anti-pernicious anaemia factor and all the other secondary factors like Tyrosine, Xanthine and certain peptides. In addition to this, B-Folin is reinforced with synthetic Vitamins of the B - complex group. B-Folin should therefore prove very useful in all types of Macrocytic anæmias especially those associated with sprue. It can definitely be given with very good effects in cases of pernicious anæmia.

Procurable everywhere from all the leading Chemists or apply to Manufacturers

Navaratna Pharmaceutical Laboratories,
P.B. No. 13, Mattancherri P.O. COCHIN.

AN APPROVED METHOD OF *Family Planning*

GYNOMIN TRADE MARK

The Scientifically Balanced, Antiseptic and Deodorant Contraceptive Tablet

Samples and medical literature sent on request.

For social and economic reasons, medical advice is now being sought, more than ever before, on the subject of "PLANNED PARENTHOOD," and Birth Control in its clinical aspect is rapidly becoming a specialised branch of Medical Science. GYNOMIN is spermicidally efficient, clean in application and harmless to health. It is non-irritant, non-greasy and keeps perfectly in all climates.

Formula No. CDL. 1040.

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COATES & COOPER LTD

PYRAMID WORKS · WEST DRAYTON · MIDDLESEX · ENGLAND

LUDERMOL (Psoralia - Corylifolia)
In the treatment of **LEUCODERMA**

LUDERMOL is the oleo-resinous extract from the seeds of BOUCHI (Psoralia - Corylifolia).
By its special selective action on the melanoblasts it restores pigment to depigmented skin in Leucoderma.
LUDERMOL (Bouchi) Oil – Sterilized for local intradermal injection in minim doses by multiple punctures.
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LUDERMOL OINTMENT - containing solid extract of Bouchi 20%, Chaulmoogra Oil 40% and Lanoline Anhydrous 40% - for external application.

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a concentrated
VITAMIN B COMPLEX
Preparation containing Proteolysed Liver, Vitamin B Complex, Iron, Glycerophosphates, Manganese & Copper

Indications :-
Anaemias, Convalescence after fevers, Vitamin B Complex deficiencies resulting in gastrointestinal, nervous or skin disorders, Deficient growth.

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Without it, the entire efficacy of the product would be nullified.

KOROMEX *Jelly* & KOROMEX *Cream*

These products have been medically endorsed in clinical experiments as having the HIGHEST SPERMICIDAL POWER possible to attain.

Proper pH, 4'4 to 4'6 for the Jelly
4'2 to 4'4 for the Cream.

Sole Agents:
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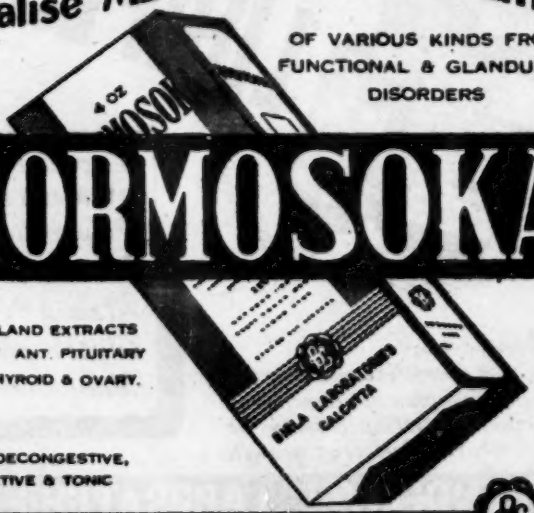
To Normalise MENSTRUAL ABNORMALITIES
OF VARIOUS KINDS FROM FUNCTIONAL & GLANDULAR DISORDERS

Re HORMOSOKA



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PERFECT CYCLE
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VEGETABLE LAXATIVE, DECONGESTIVE, ANTISPASMODIC, SEDATIVE & TONIC

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Hi-Enterol

Iodochloroxyquinoline

A non-toxic, chemo-therapeutic agent for the treatment of acute and chronic Amoebic Dysentery.

Packed in tubes of 20, bottles of 100 and 500 tablets of 0.25 gm.

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LOW TOXICITY ADJUVANT IN TUBERCULOSIS

PARASALINDON

PARA-AMINO-SALICYLIC-ACID

5 GRAINS PER TABLET. IN BOTTLES OF 200, 500 AND 1,000 TABLETS

Manufactured by

INDO-PHARMA

PHARMACEUTICAL WORKS

BOMBAY 14 **CALCUTTA 13**

LITERATURE ON REQUEST

CALCINATE

It is an aqueous solution of double salt of Calcium Gluconate and Calcium d-Saccharate for parenteral use. The special advantages of "CALCINATE" over ordinary Calcium Gluconate preparations are:-

(a) This double salt is highly soluble in water and does not precipitate even from a solution equivalent to 30% Calcium Gluconate on keeping or due to variation of temperature.

(b) The pH of the solution is approximately 7·0.

(c) Its intramuscular injections are practically painless. Intravenous administration does not cause any adverse side effects, such as febrile reaction or rigor.

LIQUID ALKACITRON

It contains 120 grs. Disodium hydrogen Citrate per fluid oz. It is a systemic blood alkaliser.

Unlike ordinary Alkali Mixtures, it does not interfere with the normal digestive process.

It has a very pleasant aroma and is highly palatable. Even fastidious patients have a strong liking for it.

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U.D. VITAMIN B-COMPLEX

Is a sufficiently potent preparation containing the important factors—Thiamin, Pyridoxine, Pantothenic acid, Riboflavin, Niacinamide in liver extract base. It is of unsurpassed dependable purity and being in balanced proportions, allows a greater accuracy of dosage.

Packings:

Boxes of 6 ampoules of 1 & 2 c.c. & 10 c.c. R/C vial for Intramuscular Injection

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T'PHONE :— West 1034.

Agents for Madras Presidency :—
Messrs. APPAH & CO.,
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T'GRAM :— "BENZOIC" Cal.

'Ostocalcium', presented in a highly palatable form, contains both Calcium and Vitamin D. 'Ostocalcium' provides complete oral calcium therapy and promotes maximum absorption and utilization of the mineral.

INDICATIONS

To meet deficiencies of Calcium or as a dietetic supplement, e.g. pregnancy, lactation; to help the growth of healthy bones and teeth of the young; in peripheral circulatory disturbances and exudative conditions; before and after operation; certain skin conditions like urticaria, eczema; in general debility and muscular atonia.

GLAXO

IN BOTTLES OF 50 TABLETS — **OSTOCALCIUM TABLETS** — IN BOTTLES OF 250 TABLETS

GLAXO LABORATORIES (INDIA) LTD. BOMBAY • CALCUTTA • MADRAS

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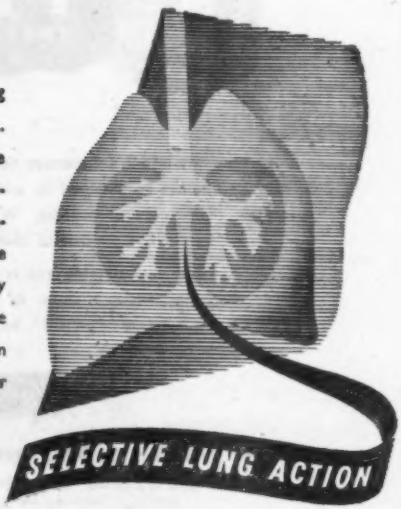
Discovery of a unique penicillin ester

ESTOPEN

Here is a powerful new weapon for combating pneumonia, bronchitis, bronchiectasis ... indeed, all penicillin-sensitive infections of the lung and associated tissues. Given by intramuscular injection, ESTOPEN has the unique property of focusing penicillin activity in the lungs—an effect derived from its special affinity for lung tissues. The hydriodide of the diethylaminoethyl ester of penicillin G, Estopen is a dry powder ... is easily suspended in water ... and is very simple to inject.



ESTOPEN

Single-dose vial (500,000 units Penicillin)

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When Signs & Symptoms indicate Vitamin B Deficiency

Prescribe:

'PLEBEX'

TRADE MARK

Since Vitamin B deficiencies seldom or never occur singly, best results can be obtained by administering the entire Vitamin B Complex from natural sources. WYETH'S 'Plebex' includes the complete Vitamin B Complex as contained in yeast.

ELIXIR 'PLEBEX' is palatable and is supplied in bottles of 4 fluid ounces. For more severe cases of Vitamin B deficiency, prescribe WYETH'S INJECTION 'PLEBEX', supplied in 10 cc. vials.

Wyeth

JOHN WYETH & BROTHER LIMITED, LONDON

Distributors in India and Burma: GEOFFREY MANNERS & COMPANY, LIMITED
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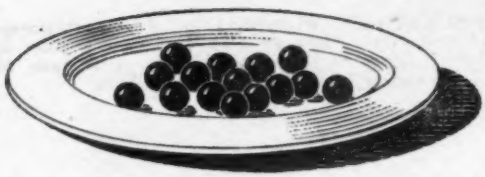
Stronachs

Adexolin attacks the

BACKGROUND

of illness



In strengthening the body's resistance to infection, the value of vitamins A and D is well established; but Adexolin—the Glaxo preparation of these vitamins in high concentration—is also a powerful aid to restoration of health after sickness, attacking the 'background of disease' through the natural mechanisms.

For your adult patients you can advise the popular protective routine—'one Adexolin capsule daily'; for the infant and child, Adexolin liquid is the preparation of choice, each drop supplying a balanced and standardised amount of the essential vitamins A and D.

GLAXO

CAPSULES: Bottles of 25 and 100. Tins of 1,000.

ADEXOLIN

LIQUID: Bottles of 14 cc. and 2 oz.

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4

LOW COST

Vitamin therapy

For patients who cannot afford imported Vitamin preparations, Madras Government Shark Liver Oils may be prescribed. Since Vitamins A & D are particularly susceptible to loss of potency in storage, the fresh natural sources of these oils give greater assurance of their full effectiveness in treatment.

Madras Government Brand

SHARK LIVER OIL

Sold in 1 lb. bottles at a price which works out to ¼ anna per day, for a full adult complement of Vitamins A & D. For the lower classes, whose diets are usually deficient in fats, the refined vegetable oil with which the fish oil is blended provides valuable extra food.

Standardised to

VITAMIN A 1,500 International Units
VITAMIN D 100 per gramme.

Sold in 40 c. c. bottles, this product compares favourably with Halibut Liver Oil and the synthetic Vitamins. It is almost tasteless in milk or fruit juice. Its fat content is just sufficient to enable absorption of the Vitamins, but not enough to cause digestive upset, even in coeliac conditions.

Standardised to :

VITAMIN A 12,000 International Units
VITAMIN D 1,000 per gramme.

Fresh concentrate of

SHARK LIVER OIL

GOVERNMENT OIL FACTORY, MADRAS

Department of Industries & Commerce

GOVERNMENT OF MADRAS

Distributors for South India:—PARRY & CO. LTD., MADRAS.

BSTA'S-804

In THREE strengths—

FOR ORAL ADMINISTRATION

DERIVED FROM THE NATURAL OESTROGEN

EXTREME POTENCY MEANS MINUTE DOSAGE

WITHOUT SIDE EFFECTS

AT LOW TREATMENT COST

MENOPAUSAL SYMPTOMS controlled in 6 to 10 days. Initial daily dose half to one 0.05 mg. tablet followed by daily maintenance dose of one 0.01 mg. tablet.

INHIBITION OF LACTATION, first two days two 0.05 mg. tablets twice daily, next two days one 0.05 mg. tablet twice daily, then one 0.05 mg. tablet once daily for three days. For prostatic carcinoma and other indications, see literature.

Tablets of 0.01 mg., 0.05 mg. and 1 mg. (scored) Tubes of 25. Bottles of 100.

ORGANON LABORATORIES LTD.

Literature on request from

Sole Agents for India, Pakistan and Burma

MARTIN & HARRIS LTD.

Branches:

Calcutta: Mercantile Buildings, Lall Bazar St. *Bombay:* Savoy Chambers, Wallace Street, Fort. *Delhi:* Chandni Chowk. *Madras:* Sunkurama Chetty Street. *Karachi:* Katrak Terrace, Machi Miani Road. *Chittagong:* 344 Jubilee Road. *Rangoon:* P.O. B.97.

'OSSIVITE'

TRADE MARK

CAPSULES

NATURAL CALCIUM
WITH VITAMIN A & D

FOR
MOTHER and CHILD

Provision for an extra-dietary quota of calcium in concentrated form during lactation is found to be necessary for most nursing mothers.

'Ossivite' provides calcium in an ideal form as it is prepared from Bone Meal, a natural source of this mineral. 'Ossivite' also contains vitamins A and D and is, therefore, specially recommended for mother and child.

According to Bourne and Williams, the ordinary diet does not supply enough Vitamin D for children and certainly not enough for pregnant and lactating women. Two capsules of 'Ossivite' twice daily (total 4) after meals with a glass of water is the usual dosage which may be varied to suit the calculated deficiency relative to the diet of the patient.

Wyeth

'OSSIVITE'

TRADE CAPSULES MARK

Available in bottles of 60 capsules.

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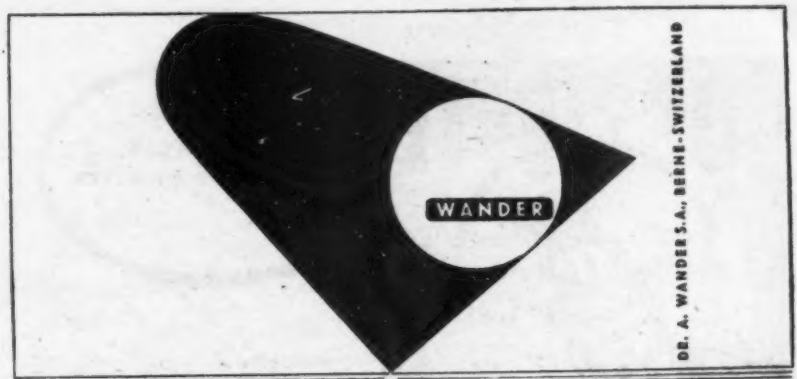
Stronacha



ASMAC

Symptomatic remedy for Bronchial Asthma.

Composition :

Allobarbitone 0·03 gm.
Ephedrine hydrochloride 0·015 gm.
Caffeine 0·1 gm.
Theophylline-ethylenediamine 0·15 gm.
Extr. Ipecacuanhae 0.02. gm.

STOCKS ARE NOW AVAILABLE.

Sole Importers :

"WANDER" PHARMACEUTICAL DEPARTMENT

GRAHAMS TRADING CO., (India) LTD.,

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A VALUABLE SOURCE OF PROTEIN

Indicated in:

Pre-and post-operative treatment

Febrile conditions

Pregnancy and lactation

Dysentery etc.

Clinical observation shows that these conditions are accompanied by protein depletion, resulting in a negative nitrogen balance. The condition of the patient may further aggravate this, owing to his inability to consume the food offered. In such cases care should be taken to include in the diet selected foods of high protein value which are palatable and easy to assimilate.

Brand's Essence of Chicken is a first-class protein of animal origin. Being partly hydrolised, it is capable of easy ingestion, digestion and absorption. It is extremely palatable and may be taken either as a jelly or as a liquid. It is an ideal means of supporting convalescence and restoring a positive nitrogen balance.

BRAND'S ESSENCE OF CHICKEN

IN 10 CC PHIALS

Manufactured by: **BRAND & CO., LTD., LONDON**

Agents: **GRAHAMS TRADING CO. (INDIA) LTD.**

CALCUTTA — MADRAS — BOMBAY — DELHI.

FOR THE
PROPHYLAXIS
AND
TREATMENT
OF
IRON-DEFICIENCY
ANAEMIAS

THIAMINE
HYDROCHLORIDE
B_1

RIBOTHIRON

RIBOFLAVIN
B_2

IRON
FERROUS
SULPHATE

'Ribothiron' Tablets are specifically designed for the prophylaxis and treatment of iron-deficiency anaemias. Each sugar-coated tablet provides ferrous sulphate exsiccated 0.2 gm., clinically the most effective and best tolerated form of iron, in combination with two essential B vitamins-thiamine hydrochloride (vitamin B_1) 0.5 mg. and riboflavin (vitamin B_2) 0.5 mg. -which may be necessary for normal absorption and utilization of this important element.

SHARP & DOHME

SOLE IMPORTERS : VOLKART BROTHERS

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Scientific Literature from Bombay P. O. Box 199.

NERVOUS DISORDERS

The importance of
CORRECT NUTRITION
cannot be overlooked!

PATIENTS suffering from nervous disorders of neurasthenic, hysteric or neurotic type frequently have accompanying digestive trouble. In such cases, it has been found that, as an aid to improved nutrition, ' Ovaltine ' is unsurpassed, because it is so easily assimilated.

Containing a variety of vital food elements, which are frequently insufficient in the average day-to-day diet, ' Ovaltine ' supplies these factors in the form of a delicious beverage.

It is a concentrated extraction combining fresh creamy cow's milk, ripe barley malt, specially prepared cocoa and other energy-giving foods together with natural phosphatides and vitamins. It is further fortified with additional vitamins B and D. *The nutritional and vitamin content of ' Ovaltine ' is of special importance. There is nothing like ' Ovaltine '.*

Taken just before retiring, ' Ovaltine ' helps to induce restful, restorative sleep and is specially beneficial where insomnia aggravates the nervous condition.

Because of its sedative effect, as well as its high nutritive value, ' Ovaltine ' has won a respected name in the treatment of Nervous Disorders.

OVALTINE

Distributors: Grahams Trading Co. (India) Ltd., 16, Bank Street, Bombay, also at *Calcutta and Madras.*

A. WANDER LTD., 42 Upper Grosvenor Street, London, W.1. Laboratories, Works and Farms: King's Langley, Herts, England

OM.1078

THE FIRST ANHYDROUS NEUTRAL CALCIUM PARA-AMINO-SALICYLATE

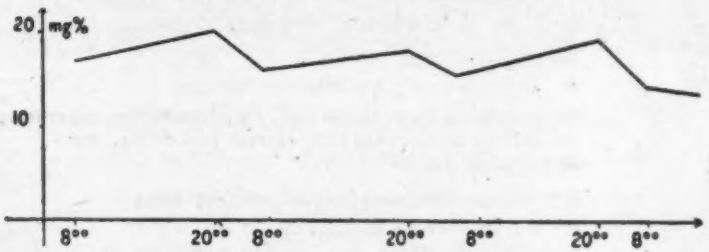
(Boehringer, Mannheim, W. Germany)

INTRODUCED IN INDIA, IS

"P. A. C."

"P.A.C." combines in an ideal form, PAS and Calcium. Besides the fact that it is exceedingly well tolerated, and brings about an early improvement of clinical symptoms, such as nightsweats, temperature and expectoration, with a tendency of increase in weight, it offers a number of other advantages in the treatment of T.B., one of the most outstanding being the absence of diarrhœa which is frequently found after administration of other salts of PAS.—

Pas-blood-level after administration of Neutral Calcium Para-Amino-Salicylate ("P.A.C.")
1 G of "P.A.C." 4 times a day - Total in 3 days=12 G.



The 'graph' reproduced above shows that 4 G = 8 tablets of "P.A.C." per day will result in, **and maintain,** a remarkably high blood level with extensive bacteriostatic reaction.

The daily dose of 4 G of "P.A.C." taken by the patient, was administered in 4 equal doses spread over the **day**. No "P.A.C." was given at night. Yet the following morning, the blood concentration was found to be in the neighbourhood of 15 mg.% ! ! The significance of this for both doctor and patient need hardly be emphasized.

P.A.C. is 100% active substance, each 100 G corresponding to 88 G of PAS and 12 G of Calcium.—It keeps **stable** in all climatic conditions.

THE COST OF TREATMENT OF A T.B. CASE CAN BE REDUCED TO THE MINIMUM BY THE USE OF "P. A. C."

Doctor, while prescribing neutral calcium para-amino-salicylate write.

"P. A. C." . . . *so easy to remember* !

For further particulars write to :

NEO-PHARMA LIMITED

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PROTECT and REJUVENATE
THE HEPATIC CELLS
with
"NEO-METHIDIN"

d'l Methionine—the essential amino-acid
(Degussa, Frankfurt, W. Germany)

Indicated in:

- Cirrhosis of the liver
- Liver insufficiency with coma hepaticum
- Infectious and toxic hepatitis
- Acute yellow atrophy of the liver (acute jaundice)
- Toxic symptoms in pregnancy, eclampsia, œdema of pregnancy
- Fatty infiltration of the liver, Ascites
- Amœbic liver enlargements
- Complicated liver abscess damages
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- Alcoholism
- Anæmia due to protein deficient diets
- Keratoprotein deficiency
- Adjuvant to vitamin A-therapy of night-blindness

Although of recent discovery, METHIONINE-therapy has been favourably commented upon by numerous Research Workers in Germany, United States of America and recently in India.

Boxes of 5 ampoules of 10 cc. of 2 G active substance
Bottles of 75 tablets of 0.25 G

IN SERIOUS CASES, "NEO-METHIDIN" IN AMPOULE PORM, **ONLY** INJECTABLE METHIONINE-PREPARATION, SHOULD BE RESORTED TO

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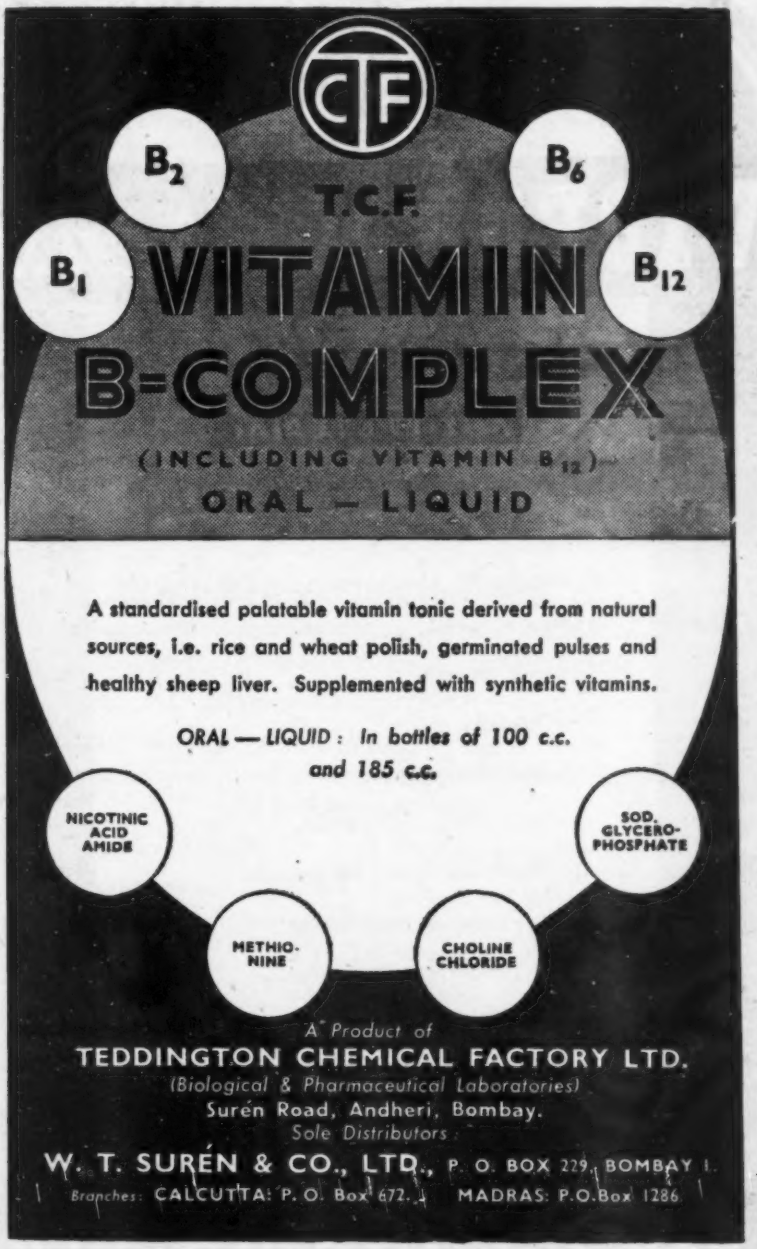
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B2
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VITAMIN
B12
B-COMPLEX
(INCLUDING VITAMIN B12)
ORAL — LIQUID
A standardised palatable vitamin tonic derived from natural sources, i.e. rice and wheat polish, germinated pulses and healthy sheep liver. Supplemented with synthetic vitamins.
ORAL — LIQUID : In bottles of 100 c.c. and 185 c.c.
NICOTINIC ACID AMIDE
SOD. GLYCERO-PHOSPHATE
METHIO-NINE
CHOLINE CHLORIDE
A Product of
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VIOFORM *Cream*

FUNGICIDAL

ANTIBACTERIAL

NON-IRRITANT

An excellent therapeutic agent in the treatment of :

Sycosis barbae,

Folliculitis,

Infected eczemas,

Seborrheic dermatitis,

Post-auricular dermatitis,

Fungous infections,

Impetigo contagiosa,

Psoriasis,

Acne vulgaris,

Athlete's foot, etc

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FOR THE PREVENTION & TREATMENT OF

Malaria

Quinaglobin

THE ANTI-MALARIAL LIQUID FOR ORAL USE

Indicated in acute and chronic Malaria and its after-effects such as Anaemia, Splenomegaly, Debility, Anorexia etc.

COMPOSITION

Each fluid ounce contains :	
Quinine Hydrochloride	24 Grs.
Liq. Arsenicalis	4 Mins.
Ext. Nux Vomica Liq.	4 Mins.
Haemoglobin	4 Grs.
Proteolysed Liver Extract from 32 Grs. of Fresh Liver.	
Proteolysed Stomach Extract from 16 Grs. of Fresh Stomach.	
Hydrolysed Yeast Extract from 24 Grs. of Brewer's Yeast.	
Copper	Traces.

Bottles of 4 ozs. and 1 lb.

Alembic

ALEMBIC CHEMICAL WORKS CO., LTD., BARODA.

AL 942

Calchemico's

GASTRO-INTESTINAL THERAPY

including Liver Therapy

1. TRYZYM TABLETS:—

A combination of the four digestive enzymes Pepsin, Pancreatine, Diastase and Papain acting both directly and indirectly to excite secretion of digestive juices, Nux Vomica and the components of Vit. B acting as supplementary tonics. Tryzym would be found ideal for the treatment for varied types of dyspepsia, the combined enzymes and tonics will help digestion and restore the functions of the digestive and hepato-biliary tracts.

2. PTYCHO SODA CO. TABLETS:—

A balanced combination of sialagogue antacid and adsorbents with carminatives and essential oils. Useful for gastritis, hyperacidity and sedative action in the gastro-intestinal tract.

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Original Articles

THE PLACE OF ANGIOCARDIOGRAPHY IN CLINICAL MEDICINE*

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THE place of angiocardiography in clinical medicine (I include surgery also under broad title medicine) is unique as well as enduring. In no branch of radiology has more progress been made recently than in the diagnosis of cardiac disease in which the most outstanding achievement is angiocardiography or contrast cardiac visualisation. Angiocardiography has revolutionised the accurate diagnosis of congenital heart diseases without which intracardiac surgery, in which great strides have been made recently in the West, is not practicable.

Angiocardiography or contrast cardiac visualisation consists in the injection of an inert, non-irritating, non-toxic and rapidly eliminable dye into the venous blood stream and rœntgenographic demonstration of the blood thus rendered opaque while it is within the heart chambers. The dye chiefly used is 70% Diadone.

TECHNIQUE.—Anæsthesia is used in cases of children under ten. Some specialists do a premedication with Nembutol. A sensitive test for iodine may be done before starting the process. If anæsthesia is not used, then the patient must be fairly intelligent

* Specially contributed to THE ANTISEPTIC.

and co-operative. He must refrain from making unnecessary movements. Rehearsals and training of the patient and X-ray team are required.

POSITIONING.—Posterio-anterior and left anterior oblique have been found to be the most suitable positions.

APPARATUS.—At least a 50 c.c. syringe is necessary. A large wide bore needle at least 1 mm. wide or better a cannula with a side arm which can be connected to a saline drip to prevent blood clotting into the cannula, is necessary. Cephalic or basilic vein (ante cubital veins) is cut and the cannula is tied in the vein. The other end of the cannula is connected by syringe and the wide arm of the cannula to a saline drip. 30 to 50 c.c. of 70% Diadone is taken in the syringe (30 c.c. for children and 50 c.c. for adults). Withdraw a few cc. of blood which will flow to the top of Diadone and rapidly inject the whole of this Diadone within a course of 2 seconds (rate of injection about 30 c.c. per second). This very rapid injection of the dye permits an intracardiac concentration of the dye which is more radiopaque than the muscle mass of the heart. The injected dye will mix with the blood returning from head and neck when it reaches superior vena cava and with the blood of inferior vena cava when it reaches the right auricle. Within one or two seconds the dye reaches the right auricle. One second after the dye reaches the right auricle, it will reach the pulmonary arteries and about 4 seconds later in a normal heart it will be found in the left ventricle having passed through lungs, pulmonary veins and left auricle. Eight seconds after the injection it will reach the systemic circulation and distributed all over the body. Since these changes take place very rapidly, no single X-ray film can hope to show the whole train of events. Serial films must be taken at intervals of not more than one second if the path taken by the dye is to be followed in any detail. First exposure must be made just before the completion of injection and then proceed fast taking radiographs at least in intervals of seconds for the next ten seconds. Radiography can be carried out according to two main principles.

I. Direct radiography with normal full-sized X-ray films using a mechanical casette changer.

II. Indirect radiography of fluorescent screen and in the latter case eventually with X-ray cinematography.

As pointed out by Barclay, Franklin and Pitchard (1945) direct radiography affords superior picture quality and presents possibilities of detailed study. Till recently only 1 and 2 radiographs per second could be taken and the slow speed was an adverse factor. But this defect has been rectified at Nortull Hospital, Stockholm, where they have now constructed an apparatus, which gives a speed up to 10 exposures per second. In clinical angiocardiography direct radiographic method gives valuable results concerning the physiological and pathological morphology of the chambers of the heart

and of great vessels as well as abnormal communications and alterations in the direction and course of blood flow. In the Nortull Hospital, apparatus synchronous serial exposures in 2 places can be carried out. The rate of exposure is ten per second. Exposure time is ·02 second and sixty casettes will be exposed during a period of six seconds which in children is the average time for the passage of contrast medium through both right and left side of the heart and cut through aorta with consecutive visualisation of all these areas.

View: L.A.O. view—k.v. = 70 k.v. for infants, 80 to 85 k.v. for children depending upon the size of the child. M.A. used varied from 300 to 450. Focus film distance varies from 100 to 120 cms. Size of film 13/18 cms. Because of the shortness of exposure, degree of clarity of the pictures is very high (blurring due to cardiac movement is practically eliminated). Radiographs give good detail and require no enlargement.

II. Indirect radiography of fluorescent screen (photoflurography):—Dr. A. T. H. Hills, Director of the Department of Diagnostic Radiology, Guy's Hospital, London devised an apparatus for angiocardiography in 1948 which is an adaptation of mass miniature principle of indirect radiography (Radiography of fluorescent screen), but the films size (5/5 inches) is large enough to be studied without magnification. The general construction consists of an Eastman Kodak Camera mounted vertically under a special trolley. A fluorescent screen is supported horizontally just under trolley top by a light proof tunnel at whose base is fixed the camera. X-ray tube is positioned over the screen at a distance of 30 inches. Maximum possible exposure is ·5 second. Roll film is used and there is synchronisation of camera and X-ray unit. Average exposure factors for an adult are 50 m.a. second at 85 k.v.

Due to long exposure and the lack of brightness of the fluoroscopic screen photoflurographic pictures will not be so distinct and well defined like that of direct serial radiographs. Cineradiography which is the best indirect method is not practical at present since for satisfactory cineradiography at least 20 films must be exposed per second. But encouraging progress in the development of various methods of screen amplification to 500 times or more is being made in U.S.A. (by electronic magnification). This screen intensification will accentuate the place of photoflurography as a diagnostic aid and remove the barriers to practical rœntgen cinematography. Dark adaptation will become unnecessary and will bring screen brightness within the range of gamma vision.

Contraindications to angiocardiography:—Liver damage, renal disorders and acute illness. The patient usually experiences such reactions as flushing and nausea. A transient fall of blood pressure may occur. Thrombosis of veins have been reported. Even sudden deaths had happened. But these complications are very rare.

Dr. Hills had 2 deaths in his first 37 cases. Professor Sosman of Harward Medical School and Peter Bent of Brigham Hospital had no mortality in his first 100 cases. Sussman of Mount Siani Hospital, New York, U. S. A. has done 2000 cases of angiocardiography without a single fatality even though he uses Iodoxyl group of dye which produces more venous spasm than Diadone. Coramine and Adrenalin must be ready handy to central allergic reaction. According to Dr. Peter Kerley of Westminster Hospital, London, one of the authorities in cardiovascular radiology, angiocardiography must be done only in carefully selected cases under expert care and must not be done as a routine.

Clinical Uses and Indications

A. Accurate diagnosis of congenital heart diseases.—Till a very few years ago, congenital heart disease was of little general interest. Diagnosis was only of academic interest since the blue baby could have nothing done for him. Angiocardiography and recent advances in cardiac surgery and anæsthesia have thoroughly changed the whole outlook. Operations have been done in the heart with almost miraculous results in selected cases. Angiocardiography is useful not only in the diagnosis of the actual lesion but also in pre-operative investigations and in assessing the results of the operations. Angiocardiography is specially indicated in the diagnosis of (1) Fallot's tetralogy; (2) Eisenmenger's complex; (3) patent ductus arteriosis; (4) coarctation of the aorta; (5) septal defects; and (6) pulmonary stenosis. The following are the characteristic angiocardiographic appearances which will help in the correct diagnosis of the above mentioned congenital heart diseases:

(1) *Fallot's tetralogy*:—This disease when correctly diagnosed holds out the best hope for surgery. The lesion is a combination of pulmonary stenosis, right sided aorta, enlarged right ventricle and ventricular septal defect. Angiocardiography shows the simultaneous specification of aorta and pulmonary artery, the aorta, much more so than the pulmonary artery on account of pulmonary stenosis. Descending aorta so far as iliac is often well outlined. The stenosis itself may be demonstrated if of the subvalvular type and the artery is dilated beyond the stenosis, but in the valvular type there appears to be a block with poor filling beyond. The course of the right sided aorta and any abnormalities of its branches can be well shown. This is of importance to the surgeon who is contemplating performing the Blalock's operation of anastamosing one of the aortic branches with a branch of the pulmonary artery. The right subclavian and the right pulmonary artery are the two commonly used for this operation.

(2) *Eisenmenger's complex*:—This is the same as Fallot's except there is no pulmonary stenosis; there is dilatation of the pulmonary artery. Blalock's operation is of no use in this condition.

Angiocardiography shows simultaneous opacification of the aorta and pulmonary artery, the latter is dilated and is more clearly outlined than in Fallot's tetralogy[1].

(3) *Patent ductus arteriosis* :—Angiocardiography presents a picture which occurs in no other condition. There is a distinct localised dilatation of the descending aorta. This may vary in size but its direction is always towards the pulmonary artery. This dilatation best seen in the LAO position is thought to be due to either to a diverticulum caused by the traction of the ductus or to the infundibulum of the ductus itself. The ductus is not seen apart from this bulge which persists after ligature of the duct. Very good results are seen after the operation which consists of tying the duct.

(4) *Coarctation of the aorta* :-This is a stenosis of the aorta at its isthmus, that is where the ventral and dorsal aortic meet in fœtal life and also when the ductus arteriosis enters the aorta. Coarctation of the aorta has ceased to be of academic interest only since the introduction of successful resection of stenosed portion by Crawford and it has become increasingly important for the radiologist to make a correct diagnosis. Angiocardiography may prove to be of immense value not only in demonstrating the size of the constriction but also in providing evidence as to the extent of collateral circulation.

(5) *Septal defects*:-Angiocardiography demonstrates the enlarged right auricle, right ventricle and the pulmonary artery but does not give the exact size of the heart chambers. Cardiac catheterisation may show the catheter passing from the right auricle to the left auricle. This condition is not incompatible with a fairly useful life.

(6) *Pulmonary stenosis* :—Angiocardiography shows the dye in the right auricle and right ventricle but none in the pulmonary artery and its branches nor is the aorta outlined.

B. In the investigation of tumours of the mediastinum.—In the differentiation of mediastinal tumours from the aortic aneurysm angiocardiography plays a decisive part.

C. In the determination of the site and degree of obstruction of blood vessels like superior vena cava, angiocardiography is very useful.

In short angiocardiography is one of the milestones that punctuate the onward march of the clinical rœntgenology of the heart and, without its aid, modern cardiac surgery which is such a great boon to the ailing humanity, is not feasible.

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ESSENCE OF INFANT FEEDING*

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THE subject which I have chosen for my paper on this occasion namely, Infant Feeding is no doubt one of great importance, but I may be pardoned if I venture to suggest that this subject has not been receiving the amount of attention it deserves in our country at the hands of the general practitioners who treat children in the course of their practice. Any one not necessarily a doctor, who has travelled in Europe and America is struck by the vast amount of knowledge on infant feeding made available to mothers through pamphlets, popular magazines, etc. It is to be regretted that our country compares rather unfavourably with the West in this respect for we have really scanty scientific information available to mothers in our country. In these few minutes allotted to me, I hope to give some suggestions regarding infant feeding which I hope will be useful.

Breast feeding.—Mother's greatest gift to her off-spring is her breast milk. It is sometimes a fashion in higher circles of society not to suckle their young ones, for some are "Can't be bothered" type or "Haven't any time" type and a few others are "I can't sacrifice my figure" type. On the contrary, there are mothers mostly in the villages, who suckle their young ones even up to the age of 4 or 5 years, probably due to ignorance or their popular feeling that future pregnancy can be avoided or their intervals prolonged.

The advantages of breast milk can be summed up by stating that it is the best, ready made sterile milk, well balanced in proteins, fats, carbohydrates, vitamins and salts and does not need much knowledge or preparation in giving the feeds. Gastro-intestinal and deficiency diseases are comparatively less in a breast-fed baby than in an artificially fed one. To ensure a proper supply of milk in the mother, her health has to be cared for with proper food, vitamins and iron during the ante-natal period and the care of the breasts and nipples during the later months of pregnancy and post-natal periods.

The causes of failure of lactation are often in the mother but sometimes in the child. For instance, the mother may be psychologically incapable of suckling the child or she may be very anæmic which in turn reduces the milk supply. Infections of the breasts and cracked nipples which later become infected prevent proper suckling due to the unbearable pain which it produces. The child is unable to grip the breasts in the mouth if they are either poorly developed or the nipples retracted. In the child congenital malformations in the mouth and palate and infections of the tongue like

* Pa per read at the 6th Scuth Indian Provincial Medical Conference held at Kozhikode, Oct. 1951.

thrush may prevent the proper action of suckling there by reducing lactation. The child may be too weak due to prematurity or other defects in the development which prevent normal breast feeding.

Colostrum, which is secreted from the breasts in the first 3 or 4 days after parturition, has an immunizing property and so must be given to the infant even though it is in small quantities. These few days will also be a practice period for both the mother and the child for cultivating the art of suckling and when true milk flows the child would have by that time gained experience.

Breast milk must be given at regular intervals of 3 or 4 hours and 5 to 7 minutes at each breast at each time must be spent. The proper timings would be 6, 9, 12 (noon), 3, 6, and 9 p.m. six feeds in all if the infant is small and less than 6 pounds at birth. Otherwise 4th hourly schedule is better, 6, 10, 2, 6, 10 p.m. 5 feeds in all. At night a feed can be given at 1 or 2 a.m. but it must be supplemented with sugared water or bottle feed when the child is of 2 or 3 months of age. After each feed the child must be held over the shoulders and slightly patted on the back so as to get rid of the swallowed air. If the child does not show any gain in weight on breast milk alone, such an infant must have feeds in addition to the breasts, (complementary feeds). In such cases cow's milk should be given in proper dilutions of 1 part of milk to 1 part or $1^1/_2$ parts of water with a teaspoonful of sugar added to 3 oz. of the formula. Humanized dried milk powders like Similac, Sunshine Glaxo, can be supplemented in place of cow's milk where good milk is not available. Breast feeding must not be continued after 9 months and weaning should be commenced at the end of 6th month and completed by the 9th month. It is because the breast milk is not only not sufficient to the infant but also is deficient in iron. This is the period in which the child has to get accustomed to solid mixed feed and it is the correct period for such a feeding.

Overfeeding on the breasts is not so common in this country as underfeeding due to nursing mothers being underfed and anæmic. The infant who is overfed shows a rapid gain in weight out of proportion to age and height, passes frequent loose, large stools of normal colour and a tendency to regurgitate the excess at the end of the feed. This can be rectified by reducing the number of feeds to four and by prolonging the intervals of feeding.

An underfed infant is always below the average weight, always hungry and is either constipated or passes small greenish 'hunger' stools. This can be overcome hy giving 'complementary feeds'. On such an infant 'test feeding' is made. The test is made by weighing the child before and after every feed on the breasts (with excreta included during weighing by not changing the napkin) for 24 hours and the amount of breast milk the infant has taken per day is calculated. A single test feed is not enough.

Artificial feeding.—In giving feeds five fundamental principles must be adhered to and they are:

1. Energy requirement. 2. Protein requirement. 3. Inorganic salts. 4. Vitamin requirements. 5. Fluid requirements.

I feel that in general most practitioners lean too much on vitamins and minerals in prescribing a suitable diet to the infant, forgetting the essential energy and protein requirements.

Energy (caloric) requirement in different age groups is as follows:

Premature infant ..	60 cals. per pound of body weight.
Below 6 months ..	45–50 cals. per pound of expected body weight.
6 months to 1 year..	40–45 cals. do.
After 1 year ..	1000 cals. and 100 cals. per year of age.
6th year .	1500 cals.

Protein and fat requirements are very well covered in 1½ ounces of milk per pound of expected body weight and the infant gets more than 1½ ounces per pound if calculated correctly.

Fluid requirement—3 oz. per pound of body weight to a maximum of 40 oz. per day.

Most of the vitamins and essential inorganic salts are found in cow's milk except vitamins 'C' and 'D' and iron which must be supplemented.

To sum up a 10 pound baby's diet can be calculated as follows:

Energy required:–50 cals. per pound or 50 x 10=500 cals.

Sugar required:–1 oz. for a 10 pound infant. 1 oz. yields 120 cals.

The remaining caloric needs are made up by milk given (1 oz. yields 20 cals.)—380 cals. or 19 oz.

Fluid requirement for a 10 pound infant is 10 x 3=30 oz.

So the milk water ratio must:–Milk 19 oz.; water 11 oz.; sugar 1 oz. per day to be given in 5 feeds, once in four hours.

The milk must be boiled so as to destroy the germs and reduce the chances of tubercular infection. Milk is received raw and not pasteurised in this country and "no raw milk is safe". In addition all the utensils must be well washed with boiling water. If the child is on bottle, the teats must be boiled and kept immersed in water.

In addition vitamin C in the form of half an ounce of orange juice and vitamin D in the form of two teaspoonfuls of Cod-liver-oil is given. To prevent milk anæmia, as both breast and cow's milk are deficient in iron, ferrous salts are given frequently.

Cow's milk, water ratios to be given during the first year can be summed up roughly by stating that during the first 3 months—1 part of milk to 1½ parts of water. Second three months—equal parts of milk and water. Third 3 months—1½ parts of milk and 1 part of water. After 9th month whole milk can be given.

The amount of sugar added will be approximately one teaspoonful to every 3 oz. of the formula.

If good cow's milk is not available dried milk powders are preferable. A knowledge of the composition of these dried milk powders in the market like Glaxo, Cow and Gate, etc. is essential and will pay dividends. The practice of switching from one to the other in the hope of finding something suitable is to be highly deprecated, and so is the occasional suggestion that breast milk is not suitable when confronted with diarrhœal or other disorders in the infant. The following dried milk powders are in common use and recommended:

1. *Humanized dried milk powders* :—In general one measure (supplied in the tins) to one ounce of water reconstitutes a mixture equivalent to that of breast milk.

Similac (one measure to two ounces of water), Allenbury Nos. 1 and 2 (1 measure to 6 measures). S.M.A. (Wyeth) Ostermilk.

2. *Dried milk powders* :—One measure to one ounce of water reconstitutes a mixture equivalent to one ounce of cow's milk. Cow and Gate full cream, Klim, Lactogen, Sunshine Glaxo composition modified for the use of young infants.

3. *Condensed* :—(evaporated) milk. *Sweetened* :—(Milk Maid).

Advantages: (1) Keeps for a long time and no need for refrigeration and so useful in villages. (2) Has a high caloric value.

Disadvantages: (1) Too much of carbohydrates which causes fermentation and fermentative stools. (2) Rickets and scurvy occur if given for a long period.

Unsweetened :—(Ideal).

Advantages :—Correct amount of sugar can be added later and adjusted.

Disadvantages :—Does not keep for more than two days outside the refrigerator.

4. *Dried milk with low fat* :—Used for sick infants. Cow and Gate half cream, Glaxo half cream, Horlicks malted. milk (contains fully dextrinized starch).

Feeding during the first 3 weeks and the amount of the artificial milk does not depend on the caloric requirement of the new-born but on the physiological capacity of the stomach. If the new-born is on the breasts there is no trouble, for the infant takes in as much as it needs.

Capacity of the stomach : New-born a third of an ounce. 4th day 1½ oz. 7th day 2 oz. 20th day about 3 oz.

The amount given must not exceed the physiological capacity of the stomach during the first three weeks. On the first day only sips of glucose water are to be given.

The milk which is most suitable for infants other than human milk is the cow's milk and is widely used. Buffalo's milk though given to infants in some parts of India is not quite suitable due to the high content of fat as shown in the chart below. Goat's milk can be given to infants allergic to cow's milk.

Chart 1. Composition of milk of different mammals (Human, Cow, Buffalo and Goat)

Name of mammal	Protein G%	Fat	C.H.O.	Moisture	CA	P	Iron	Cals. per oz.	Vit. A I.U. per 100 G.
Human ...	1·0	3·9	7	88	0·02	·01	0·2	19	2·8
Cow ...	3·3	3·6	4·8	87·6	0·12	·09	0·2	18	180
Buffalo ...	4·3	8·8	5·1	81	0·21	·13	0·2	33	162
Goat ...	3·7	5·6	4·7	85·2	0·17	·12	0·3	24	182

—*Health Bulletin 23.*

Mixed feeding.—Infants are able to digest cereals even in an early age, as early as fourth or fifth month, and so mixed feeding with solids can be started safely by the sixth month. In the West like Great Britain and America the first infant's cereal foods are all proprietary foods which are well balanced in vitamins, proteins calcium, iron, etc. For example, in England it is "Farex" and in Canada and U.S.A. it is "Pablum." It is not possible for our people to spend money on these prepared infant foods for they are prohibitive in price and also not available even in the cities. The common cereals given to infants in South India are given in a tabular column below :—

Chart 2. Common cereals given to children

Name of cereal	Protein G%	Fat	C.H.O.	Ca.	Iron mgs%	Vit. A. 1 U. per 100 G	Vit. B micro-grams per 100 G	Cal. per ounce
Rice	6·9	0·4	79·2	0·01	1·0	0	60	99
Ragi	7·1	1·3	76·3	0·33	5·4	70	420	98
Arrowroot ..	0·2	0·1	83·1	0·01	1·0	—	—	95
Barley ..	11·5	1·3	69·3	0·03	3·7	—	450	95
Sago ..	0·2	0·2	87·1	0·01	1·3	—	—	100
Wheat (whole) ..	11·8	1·5	71·2	0·05	5·3	108	540	98
Wheat flour ..	11·0	0·9	74·1	0·02	1·9	—	120	99
Cholam ..	10·4	1·9	74·0	0·03	6·2	136	345	101
Oatmeal ..	13·6	7·6	62·8	0·06	3·5	trace	975	106

—*Health Bulletin 23. (Govt. of India).*

In South India the first infant solid food varies with the provinces. In *Karnataka* (South Kanara and Mysore) common food is ragi. *Tamilnad*—Sago (tapioca) and rice. *Travancore, Malabar and Cochin*—Banana powders and arrowroot. In *Andhra*—Sago and rice.

Rice is given in most homes in the form of rice "congee". This contains the added water which is not strained. The 'congee' or gruel is made into a fine semi-solid consistency with the help of the country-made mortar and pestle. A little salt and a teaspoonful of ghee are added. In some homes the rice is soaked in water for sometime and then dried in the Sun. The dried rice is powdered and then stored for use. Usually 2–3 tablespoonfuls of the powdered rice is mixed in 8 oz. of milk and boiled with constant stirring. This forms a thick creamy substance which is given to the infant with 3 teaspoonfuls of sugar or a little salt.

The preparation of ragi (Eleusine Coracana) for infants, known as ragi 'Manni' by the women of Karnataka is a tedious process. Ragi is soaked in water for sometime and then ground into a pulp. This pulp is strained in a seive so as to remove the husk. The strained fluid is allowed to settle and the settled mass is tied in a fine cloth so as to allow the water to drain. The solid mass in the cloth is kept overnight during which period it gets slightly fermented. The mass is then made into small rupee-sized tablets and dried in the Sun. These tablets are used for preparing the infant food—2–3 tablets, powdered and dissolved in 8 oz. of milk and then boiled with constant stirring. This ragi food, semi-solid in consistency, is given to infants with a little sugar or jaggery added.

In Travancore and Cochin, some families give powdered Bananas. The Bananas (Kunnam variety) are peeled, sliced and dried in the Sun and later powdered. This is given to infants mixed with milk and a little sugar.

It has been found by experience that ragi is very good as an infant food on account of its fairly good protein content, Vit. B, palatability and is easily digestible especially when malted.

The infant's food given mostly in South India is deficient in proteins. It contains carbohydrates in large amounts with very little proteins, fats and vitamins.

Chart 3. Foods containing high percentage of protein

Animal	Protein	Pulses	Protein	Nuts	Protein
Meat ..	18·5	Soyabean	43·3	Almonds	20·8
Fish ..	20·0	Grams	22 (app)	Ground	26·7
Eggs ..	13·3	Peas	19·7	Cashew	21·2
Skimmed milk powder ..	38	..	..	..	..
Cheese ..	24·1	...	...	...	...

—*Health Bulletin 23.*

As shown in the above Chart No. 3 animal foods and pulses contain a high percentage of proteins. Soyabean will go a long way to replenish the deficiency if powdered and mixed with the cereal given to the infant as food. Meat and fish should be given

in the form of extracts for younger infants. Pulses are given to infants in the form of fluid extract (*rasam*) and to older children in the form of *dahi*—solid part mixed with rice. Egg yolk for infants even can be started in the 6th month mixed with milk and for older children in the form of poached or boiled egg. Vegetable extracts are given in the form of soups.

Sample diet lists for an infant 8—12 months and a child 1—1½ years are given below. Here each infant should be considered as an individual and the feeds given according to its needs.

Time	8—12 months	1—1½ years
6–7 a.m. ..	Milk formula 6–8 oz.	Milk formula 8 oz. Biscuits or rusk.
10 a.m. ...	Milk formula 6–8 oz. Biscuits or rusk	Rice congee 8 oz. or ragi food 8 oz.
1 p.m. ...	Rice congee or ragi food 6–8 oz. or any cereal food and Veg. soup or meat extract.	Cereal or rice and dahi water or rice and buttermilk and veg. homogenised of meat.
3 p.m. ...	Juice of one orange with 3 oz. of water.	Juice of 2 oranges with 3 oz. of water.
6 p.m. ...	Same as 1 p.m. feed.	Same as 1 p.m. feed.
10 p.m. ...	Milk formula 6–8 oz.	Milk formula 8 oz.

After 1½ years the child starts taking adult food. The increase in the infant's diet must be made very gradual.

In short, while charting a diet for the growing child the following daily dietary requirements should be kept in mind. (From Food and Nutrition Board of National Research Council, U.S.A.).

Protein 2 grams per kilo. Fat and carbohydrates are very well covered if the caloric needs of the infant are met. Minerals: calcium 1 g.; phosphorus 1·5 g.; iron 10–20 mgs.; iodine traces.

Vitamins A.	Thiamine HCl.	Riboflavin.	Nicotinic acid.
↓	↓	↓	↓
3000–4000 I.U.	·5–1 mgms.	2 mgms.	10 mgms.
C. → 50 mgs.	D → 400–800 I.U.		

Giving of castor oil and gripewater as a daily routine is not only not necessary but harmful. Giving of coffee as an infant's diet is also to be discouraged as it does not contain enough calories, besides being harmful.

Feeding of premature infants

Premature infant, an infant below 5½ pounds, requires special care regarding feeding. The caloric requirement is a little more than that of the mature infant, 60 cals. per pound. For the first 12 hours the infant should not be fed. For the second 12 hours Glucose water, 1–2 teaspoonful should be given. After 24 hours, if the infant is able to suckle breast milk should be given every

3 hours. If it is unable to suckle, breast milk is fed with the help of an ink filler or medicine dropper or by 'gavage' feeding through a stomach tube if the baby is too small. The premature infant should be fed every 2 hours if below 3½ pounds in weight and every 3 hours if above it.

In the hospital for sick children in Toronto, Canada, the most satisfactory food for these infants has been found to be a mixture of two-third parts of breast milk and one-third part of full strength protein milk till the child is able to suckle. If the child is on artificial milk the following are recommended :

Lactic acid milk	Partially skimmed milk.
Frailac (Cow and Gate)	Humanised milk powder.

Feeding of sick infants.—If the sick infant is on breasts, it must be continued for there is no better food to the infant than the mother's milk. It is wrong to blame the breast milk for any gastro-intestinal disturbance in the infant. The only contra-indication to feeding on the breasts is tuberculosis of the mother or any infections of the breasts like breast abscesses and cracked nipples. Only addition to breast milk food is warm water with some sugar added.

Care should be taken in choosing the appropriate diet if the sick infant is on artificial milk.

In *high fevers* not associated with diarrhœa and vomiting there is no change in the infant's food, which is mainly liquid. If the child is unable to tolerate the full cream milk, half cream milk or skimmed milk or dried milk powders with low fat content can be given. Cow's milk diluted with barley water is given and I have found it very useful for it supplies the caloric needs of the infant. Maximum fluids are essential and 10% Glucose water with orange juice is very helpful.

In cases of indigestion, hydrochloric acid milk is suitable (2 drops per oz.). Lactic acid milk and buttermilk are also given with success.

In severe cases of diarrhœa and vomiting no feeds should be given by mouth for 12-24 hours and the fluid loss is replenished by the I. V. and S. C. routes.

In mild cases milk is not well tolerated and so should not be given.

The following are given with benefit :—

Lactic acid milk, buttermilk, buttermilk powders, (Eledon and Beurlac), Eleden (Nestles), (Cow and Gate), Beurlac.

Protein milk, arrowroot congee may be given diluted with buttermilk but the child should not be kept too long on arrowroot congee alone.

The advantages of giving buttermilk over full cream milk or cow's milk in digestive disorders are the following :—

(1) Forms finer clot; (2) does not neutralise the acidity of the stomach and so aids digestion; (3) more digestible due to low fat; (4) favourable influence on the flora of the intestine; and (5) buttermilk powder when mixed with rice water exercises a powerful constipating effect.

It is commonly seen in practice that chronic diarrhœas lead to a great loss of proteins and the infant becomes œdematous, when kept too long on arrowroot congee and barley water producing the common arrowroot and barley congee syndrome. The loss of protein should be replenished and the following are a few suggestions :

Plasma I. V., Casec, meat extract, soyabean, skimmed milk powder and milk protein by mouth.

Infants who are allergic to cow's milk or in cases of asthma or allergic skin conditions goat's milk or skimmed milk can be given.

In cœliac syndrome (pancreatic fibrosis and cœliac diseases) the following are recommended :

Skimmed milk, buttermilk, protein milk and banana powders.

Infant stools :—Stools of the infant depend on the type of food it takes.

Normal breast fed :—First five days—Meconium is passed-greenish stick stools.

After 10 days 4–5 stools, brownish slightly acid stools, scrambled egg appearance with no smell.

Normal bottle fed :—1-2 stools a day, dark yellow or brownish stools, normal homogenous consistency with a slight odour.

Too much fat intake :—Fatty stools. White and dry and sometimes loose, large and greasy.

Fat undigested :—Soft, yellowish white curdy stools.

Too much protein in the diet :—Stool curds are large, hard and tough-size of beans.

Excess of sugar :—Loose, frequent, greenish, frothy, sour, and fermentative and are passed with considerable gas producing irritation and redness of the buttocks.

Diarrhœa stools :—Loose, frequent, watery, greenish yellow stools with small curds.

Dysentery stools :—Blood and mucus mixed with loose frequent stools with tetanus.

Inactive liver :—Pasty white or pale yellow stools.

This subject of infant feeding is really so vast that my treatment of it during the short time at my disposal is necessarily sketchy. To deal with the subject exhaustively here is not my object. My object rather is to stimulate interest in this all too

important subject so that every practitioner of our country who plays a part in building up the health of our infants may bring to bear on his work a really enlightened mind fortified by all the well documented facts on the subject. If this paper has succeeded in stimulating this interest I shall consider my labours to have been amply rewarded.

I thank Dr. S. T. Achar, M.D., F.R.C.P. (C), Prof. of Pædiatrics, Madras Medical College, for his valuable suggestions.

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Late Sequelæ of Blood Transfusions and of Subcutaneous Hæmotherapy

Familial catastrophes due to sensitivity to Antigen Rh., are reported in a very informing article by Lacomme and Boreau. Their report is based on 20 families with 'hæmolytic disease' in the new-born infants due to sensitization of the mothers to the Rh factor. The adult mothers had received transfusions of blood in 15 cases; eleven of them were so treated in the course of obstetric management. The transfusion preceded pregnancy in 3 instances and was the only sensitizing factor detected. These three women had 7 children five of whom died; two who were given exchange transfusions survived. Combined sensitization of the mother in response to transfusion of Rh positive blood and to being pregnant with an Rh positive fœtus occurred in the remaining 12 cases. Although the 15 women had 23 living children born *before* the mothers had been given blood transfusions, 26 of 35 infants born *after* the mothers had been given blood transfusions, died. *Subcutaneous haemotherapy* was practised in 4 women when they were children of 8 to 10 years. Death of seven new-born infants resulted from sensitization of the mother to the Rh factor. One sterile woman submitted to subcutaneous hæmotherapy with her husband's blood after which she conceived thrice. The first infant was still born, and the other two died several hours after birth. The husband of the woman was a homozygote. *These observations suggest that no blood be given to a female adult or child without previously determining the Rh group. Subcutaneous haemotherapy should be cautioned against, except when there are major indications for it.—(Eng. Abst. Presse. Medicale, Paris, 58, p. 549, 1950).*

"SPA-TREATMENT"

A Plea for Its Study and Development in India

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(Continued from page 813 of Oct. '51 issue)

PART II

Resources in India

A LARGE number of thermal springs occur in India and interesting legends have grown round each of them. As early as 1850, the Geological Survey of India interested themselves in the subject and a list of over 300 hot springs was published by Oldham[1] in 1882. This list was revised and made up-to-date by La Touche[2] in 1918. In 1932, Dr. K. S. Ray contributed an exhaustive article on this subject[3]. The radio activity of some of the mineral springs of Bombay[4], Sind and Baluchistan [5,6] have been determined by Rev. Dr. A. Sierp and Dr. Steichen, while those of Rajgir (Bihar District) have been reported by Prof. N. C. Nag[7] and N. K. Chatterjee[8].

Between 1939 and 1941, the Geological Survey of India undertook a survey[9] of the thermal springs of India. Dr. P. K. Ghosh and his associates surveyed most of the important springs of Bihar, Bombay, the United Provinces, Central Provinces, the Punjab and Bengal. The samples of water were examined chemically by the King Institute (Guindy), the Public Health Laboratories (Poona), and the All-India Institute of Hygiene (Calcutta). The examination at Guindy included the spectroscopic test to detect elements that may be present in traces.

According to Dr. Ghosh, there are four main broad belts in which the majority of mineral springs in India occur:

(1) Bihar—(*a*) In a belt more or less parallel to the coal-field boundaries; (*b*) Rajgir; and (*c*) Monghyr.

(2) Along the West Coast of India in the Ratnagiri, Thana, Colaba and Surat districts.

(3) In the Sind Baluchistan area.

(4) In the Himalayan Belt.

A small number of springs occur also in the Mahanadi valley in Orissa, in Chittagong district and in isolated areas in Assam, in West Bengal, in Sikkim and in parts of South India. It is reported that at Manikaru (Kulu) the temperature of the spring is so hot that pilgrims cook rice in the hot springs which emerge from the shingle bed close to the ice cold stream of the Parvati river. The hot water is led into the neighbouring temple and rest-houses for baths and is reputed to be efficacious in cases of rheumatism. In Poonch, a thermal spring (Tattapani) discharges sulphurous waters. Hot sulphurous springs are reported to be quite common, throughout the tertiary

formations of Sind and Baluchistan on the West and in Assam and Burma on the East. The "Sohna" spring in the Punjab issues out at a temperature of 111°F. and is reported to be able to cure skin diseases. "Suraj Kund" at Hazaribagh discharges water at 173°F. and contains Sulphureted hydrogen and carbondioxide.

The mineral springs in South India have yet to be systematically studied. A warm (140°F.) spring which occurs at Gundala on the bank of the Godavari river is concealed in sand. A shallow excavation is made to reach it every year during the Sri Rama Navami Festival. Several warm springs are reported to exist in the Kurnool district. At Tiruchendur, on the eastern sea-shore, can be seen the curious phenomenon of a small well, known as "Nazhi kinar", situated at a corner of the big temple well and yielding a water very dissimilar to that of the bigger well. The water of this small well is rich in alkalinity and contains sulphureted hydrogen. A well whose water is believed to be useful against heart and kidney troubles has been reported from Surangudi in Tirunelveli District. Recently water from a well in Maddepalli near Anantapur received publicity in the newspapers as a cure for asthma. A well in Vadalur (South Arcot District) is claimed to be an excellent appetiser.

Many of these springs in India have enjoyed a therapeutic reputation from the remote past and have become places of pilgrimage. The claims of the healing properties are, however, not based on any scientific evidence since the subject has not been investigated critically. The importance of a scientific study of this subject was urged as early as 1932 by a Conference of the Indian Medical Association. Dr. Ghosh's demonstration that many of the mineral waters in India are analogous to those of established "spas" in the West supports the desirability of a critical evaluation of the therapeutic claims.

To enable a scientific study of this subject, it is essential to develop at least a few selected springs so that the patients could stay for sometime and undergo the bath-treatment under the supervision of qualified medical men who could notice the beneficial effects, if any. Such development and the provision of hotels, rest-houses and parks would prove worthwhile, even apart from the aspect of enabling a proper study of the subject. They would provide healthy holiday resorts which our country needs in the increasing tempo of modern civilisation. Many of our thermal springs are situated amidst picturesque surroundings and within easy reach of important towns. Their development can be expected to be a very effective method of attracting tourists to our country.

The development of these springs can best be undertaken by the local authority or the Government. Such development would not only be worthwhile in the interests of the country, but—judging from the response obtained by Dr. Ghosh who tried an experiment of sending our bottled mineral waters—may even prove a profitable undertaking.

APPEN

Province and district	Name of spring	Temp.°F	Gases if any
Assam—			
Cachar	Kopili group [1]	128—130	
Sibsagar	Nambor[1]	95—110	Copious
Baluchistan—			
Bolan Pass	Kirta[1]	Hot	—
Kachi	Lakha[1]	Hot	—
Las Bela	Kan Berar	—	—
Sibi	Khattan[1]	109	—
Uch	—	—	—
Bengal—			
Birbhum	Tantipara group[1]	128—162	—
	Agnikund[2]	159·8	CO_2
	Brahmakund[2]	105·9	None
Chittagong	Bharatkund[1]	Cold	Copious, inflammable
	Balwakund[1]	Cold	—
	Naulakha[1]	Warm	Inflammable
	Kaurikund[1]	Hot	Do.
	Dudhikund[1]	Cold	—
	Brahmakund[1]	Very hot	Inflammable
	Chandrakund[1]	Cold	—
	Surajkund[1]	Hot	Inflammable
	Sitakund[1]	—	—
Darjeeling	Mechi[1]	—	—
	Minchu[1]	—	—
Jessore	Khajura[1]	82	—
Bihar and Orissa—			
Atymallik	Deolijhari[1]	134	H_2S
Cuttack	Atari[1]	138	Do.
Hazari Bagh	Durai[1, 2]	110—115	H_2S intermittent
	Hatakauna[2]	71·6	None
	Indra Jurba[1]	Tepid	—
	Katkam Sandhi[1]	110	H_2S
	Kawa Gandhwani[2]	95	Slow continuous bubbles of H_2S
	Lurgurtha[1]	116	—
	Patalsur[2]	81	—
	Parasnath[2]	68	—
	Pindarkun[1]	160	—
	Sosonia[1]	—	—
	Surajkund[2]	173	H_2S
Manbhum	Charak[2]	100·4	H_2S and CO_2
	Sheopur[2]	104	Do.
	Tatloi [1, 2]	140	Do.
Monghyr	Usir[2]	87·8	None
	Bharari[2]	149	CO_2
	Bhimband[2]	125—147	Do.
	Bhowra West[2] and East[2]	110·4—111·2	CO_2
	Lachmiswar Kund[2]	152·6	None.
	Philipakund[2]	55·0	CO_2
	Rameswarkund[2]	111·2	Do.
	Rishikund[2]	105—113	Do.
	Shringirikhund[2]	87·8	None
	Sitakund[2]	112·2	CO_2
Palamau	Jarom[1, 2]	132	H_2S and CO_2
Patna	Brahmakund[2]	108·5	Intermittent N_2 water issues through spout
	Chandaramakund[2]	104·0	No gases seen Do.

DIX

Radio activity Radons m. Mc/l	Characteristics of water	Therapeutic reputation
—	Slightly sulphurous	
—	Sulphurous	
—	Strong sulphurous	
—	Very saline and sulphurous	
—	Sulphurous	
—	Saline	
—	Contains H_2S	
2·806	—	Cures skin diseases, digestive disorders and rheumatism
0·792	—	
—	Brackish, sulphurous and chalybeate	
—	—	Diuretic and slightly aperient
—	Saline	
—	Saline, sulphurous and chalybeate	
—	Saline	
—	Saline and chalybeate	
—	Saline	
—	Saline and chalybeate	
—	Pure and limpid	
—	Deposits iron oxide	Cures rheumatism and skin diseases
—	Carbonated, sulphurous	Cures gout and rheumatism
—	Contains iron	
3·28	Sulphurous and saline	Cures skin diseases, digestive disorders and rheumatism
0·345		
—	Sulphurous	
—	Brackish	
8·56	—	Cures skin diseases, digestive disorders and rheumatism
—	Saline	
10·38		
0·0197		
—	Slightly chalybeate and sulphurous	
—	Do.	
1·41		
1·150		
1·2274		
0·246		
7·779		
0·2903		
0·7654 to 1·224	—	Cures skin diseases, induces appetite, corrects metabolic errors, gout, rheumatism, etc.
4·45		Do.
9·27		Do.
3·046	—	Do.
7·85		Do.
3·6 to 5·1		
3·05		
7·85		Do.
17·7		Do.
6·87	—	Cures rheumatism, paralysis, skin diseases, osteoarthritis, diabetes, leucoderma.
6·59		Do.

APPEN

Province and district	Name of spring	Temp.°F.	Gases if any
Bihar and Orissa—*cont.*	Gangakund[2]	107·6	Intermittent N_2 water issues through spout No gases seen.
	Makhdum[2]	96·8	Do.
	Surajkund[2]	105·8	Do.
	Viswamithrakund	106·7	Do.
	Vyaskund[2]	105·8	Do.
Rajgir Group	Jamunakund[2]	106·7	—
	Ganeshgund[2]	?	H_2S
	Markandeyakund[2]	71·6	
	Ramkund (Hot)[2]	89·6	
	Ramkund (Cold)[2]	74·3	
	Sitakund[2]	104·0	
Gaya	Tapoban Brahmakund[2]	116·6	None
	Agnikund[2]	122·0	H_2S and CO_2
Bombay—			
Ahmedabad	Harsol[1]	80·90	
Broach	Kawa[1]	Cold	
Cutch	Muhrr[1]	Warm	
Kaira	Lasundra Group I	100—122	
	,, II	104	
	,, III	87—114	
Kathiawar	Tulsi Sham[1]	124	—
Kolaba	Pali[1]	108	Unpleasant
	Sapi[1]	—	Sulphurous
Panchmahals	Tuwa[1]	Hot	do
Ratnagiri	Arauli[1,2]	104	CO_2 and H_2S
	Khed[1,2]	95·9	do
	Rajapur[1,2]	140	—
	Rajwadi[1,2]	134·6	CO_2 and H_2S
	Sangameswar[1,2]	125·6	do
	Tural[1,2]	141·8	do
	Unari[1] or Unhara[2]	156·2	do
Surat	Anaval[1]	—	—
Thana	Kokner[1]	Hot	
	Satiwali[1]	Hot	—
	Vizrabhi[1]	110–136	H_2S
Central Provinces—			
Chindwara	Anhoni[1,2]	132·8	CO_2 and H_2S
Hosangabad	Anhoni[1,2]	113·0	do
Surjunga	Tatapani[1]	130–190	Smell of H_2S
Yeotmal	Khair[1]	87	—
Hyderabad—			
Gulbarga	Wujal[1]	Warm	—
Warangal	Baiora[1]	110	—
Kashmir—			
Bathstan	Askoli[1]	104·5	Emits H_2S
Bisilo Behistail[1]		160	do
Changchengmo[1]		120–150	Carbonated
Chutran	—	110	—
Duchin	—	154	Sulphurous
Kashmir	Islamabad	Tepid	—
Khorkan	—	185	—
Ladakh	Knarung	Tepid	—
Nubar	Chusan	167	—
Pampur	—	70	H_2S
Rupshu	Puga	80–174	H_2S
Madras—			
Bellary	Ramandurg	—	—
Godavari	Gundala	140	—
Hindupur	Well in Maddepalli[4]	—	—
Kurnool	Kalva	—	—

DIX—*(Contd.)*

Radio activity Radons m. Mc/l	Characteristics of of water	Therapeutic reputation
3·58		Cures rheumatism, paralysis, skin diseases, osteoarthritis, diabetes leucoderma.
4·13		Do.
6·20		Do.
1 38		Do.
3·58		Do.
3·6		Do.
?		Do.
1·73		Do.
1·0035		Do.
Trace		Do.
6·20		Do.
6·1022		Do.
4·234		
	Peculiar taste	Preventive of hydrophobia
	Saline	
	Saline	
		Cures skin diseases
	Sulphurous and saline	
—	Sulphurous and saline	Cures skin diseases
—	—	Cures skin diseases, rheumatism, gout, paralysis, obesity.
—	—	Induces appetite.
Nil		
Nil		
Nil		
Nil		
0·806		
—	Sulphurous	
—	Saline	
—	—	Induces apppetite.
		Cures skin diseases
		—
—	Clear but acid taste	
—	Insipid	
	do	
—	Deposits borax.	
—	No smell or taste.	
—	Slightly chalybeate. Deposits sulphur	
—	Deposits sulphur	
—	Deposits sulphur and gypsum	
—	Faintly sulphurous	
—	Colder springs deposit borax	
—	Slightly chalybeate and carbonated	
—	Smell of H_2S	
—	Alkaline water	Useful in asthma and tuberculosis
—	Deposits calciferous tufa	

APPEN

Province and district	Name of spring	Temp. °F	Gases if any
Madras—*(cont).*			
Kurnool—*cont.*	Lanjiabanda	88	—
	Mahanandi	89	
Tirunelveli	Nazhi Kinar	—	H_2S
,,	Well in Surangudi[2]	—	—
Punjab—			
Gurgaon	Sohna	115	Faint H_2S mainly CO_2
Kangra	Jwalamukhi	—	—
	Lausa	72	—
	Tiva	108	—
	Tatwani	120	—
Kulu	Bashisht	138	H_2S
	Khelat	104	—
	Manikaru	106·5–202	H_2S
Mianwali	Bakh Ravine	94	do
Spiti	Changhizang	—	do
Patiala—			
	Pinjaur	—	—
Simla Hill States—			
Basharh	Jaori[1]	130·5	—
Bhajji	Suni[1]	135	—
Bilaspur	Bhasra[1]	—	—
Rajputana—			
Mewar	Gangar[1]	80	—
United Provinces—			
Banda[1]	—	—	—
Benares	Bridhkal[1,2]	77	Little H_2S and CO_2
	Gaibi well[2]	77	None
Dehradun	Landour[1]	—	—
	Near Mussorie[2]	62·6–69·8	—
	Sahasradhara[2]	73·4	Much H_2S
Garwhal	Gaurikund[1]	Hot 132	
	Gaurikund[1]	Cold 72	—
	Palia[1]	Tepid	H_2S
	Tapoban[1]	Very hot	—
	Jamnotri	192·6	—
Sind—			
	Jain Pir[1]	Hot	
	Laki[1]	102–105	—
	Manga Pir[1]	99–127	
	Pith or Ghazipur[1]	Very hot	—
	Sehwan[1]	Hot	—
	Wagodur[1]	—	

My best thanks are due to Dr. M. Sirsi, for reading through criticising the draft of this article.

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DIX—(*Contd.*)

Radio activity Radons m. Mc/l	Characteristics of water	Therapeutic reputation
—	Slightly alkaline	
—	Sulphurous	
—	—	Useful in heart and kidney troubles, pains in joints and menstrual disorders.
2·93	—	Cures leprosy, scrofula, skin diseases, rheumatism, and liver troubles.
—	Contains 79 to 93 ppm., Iodine	Prevents goitre.
—	Sulphurous	Do.
—	Saline	
—	Nauseous, metallic flavour	
—	—	"Medicinal purposes"
—	Sulphurous and bitter	
—	One spring is at boiling point	
—	Deposits sulphur on evaporation	
—	Each spring reckoned a specific against a particular disease	
—	Chalybeate and sulphurous	
—	Sulphurous smell.	
—	Sulphurous	
—	Saline	A perient, prevents scrofula, dropsy and rheumatism.
—	Slightly saline and sulphurous	
—	Contains H_2S	
0·5255		
0·25		
—	Chalybeate and sulphurous	For debility, rheumatism, skin, liver and spleen diseases.
Trace to 0·8	—	For skin diseases.
0·273		
—	Chalybeate	
—	Do.	
—	Do.	
—	Do.	
—	Saline and sulphurous	
—	Contains H_2S	
—	Sulphurous	

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TRIGLYCERIDES IN NUTRITION AND METABOLISM*

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Dietary fat.—The fats in the food consist mainly of neutral fat together with small quantities of free fatty acids, lecithin and cholesterol esters. The common fatty acids in these neutral fats are oleic acid, stearic acid and palmitic acid. Fats from different sources differ mainly in their fatty acid composition. Mutton fat contain more stearic and less oleic acid than pork fat. Butter fat consists largely of glycerides of palmitic and oleic acids with small quantities of stearic acid and of lower fatty acids, such as butyric and caproic. Mixed glycerides containing a high proportion of unsaturated fatty acids are usually liquid at room temperature. By a process of hydrogenation or hardening these oils (glycerides—liquid at room temperature) can be converted into solid fats. Many commercial fats are partially hydrogenated vegetable oils.

Dietary fat requirement.—The proportion of fat in the diet varies widely from one group of individuals to another depending mainly on availability, cost, established nutritional customs, etc. The recommendation of United States Research Council[15] is—"It is desirable that fat is included in the diet to the extent of at least 20—25% of total calories". The Technical Commission on Nutrition of the League of Nations[15] states, "The minimum quantity of fat or fatty substances which should be present in the diet is not known.....Feasible dietary units might be defined as approximately 80—125 grms. of fat for a varied diet of 3000 calories."

The minimum dietary requirement of fat has not been established. Japanese[2] reported to consume only 15—20 grms. of fat per day hardly show tiredness or like symptoms ascribed by some to develop on a low intake of fat. The daily intake of fat in the most prosperous regions of Java[22] is reported to be less than 10 grms., yet the nutrition of these people is good. Brown,[4] an adult man, in the study of fat metabolism lived for 6 months on a diet containing 2 grms. of fat per day. No ill effects or untoward manifestations were observed.

Digestion of triglycerides.—Digestion of fat is carried out mainly in the small intestine by the pancreatic lipase. Small amounts of lipase present in gastric juice and succus entericus also helps the process. Some hydrolysis is also brought about by cooking of the fat. The activity of lipase is hampered by the acidity of gastric juice and by the slight acid reaction of the intestinal contents. The enzyme is destroyed by trypsin and this destruction is probably prevented by protein which have a protective action. Bile salts, on the other hand, increase the digestive

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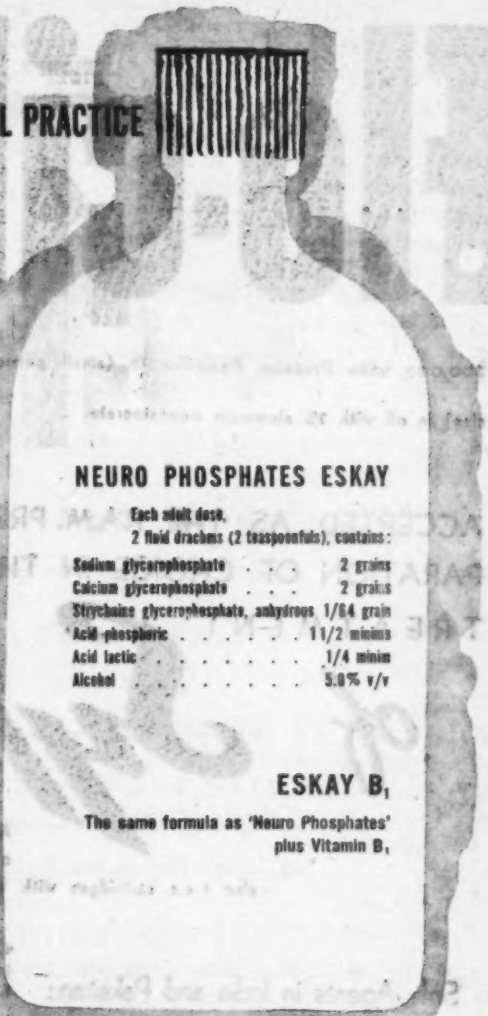
A GOOD TONIC IN GENERAL PRACTICE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activity of lipase up to fourteenfold.[24] Bile salts also help emulsification of fat. This emulsion is further stabilized by mucin. Emulsification increases the surface of fat enormously by breaking it into fine droplets and thus helps lipase to act on it.

Absorption of triglycerides.—The absorption is still a highly controversial subject. Verzar and McDougall[23] advocated the lipolytic hypothesis in 1936. According to this, the bile salts unite with fatty acids derived from hydrolysis of fat to form 'bile acid—fatty acid' complex. This is water soluble, diffusible and stable in a slight acid medium. The complex readily passes into the lining cells of the villi where it breaks up into its constituents. The split-off bile acids return to the intestinal lumen to pick up a fresh load of fatty acids and thus continues to move in and out until all the fatty acids are absorbed. The freed fatty acids are resynthesized to triglycerides in the epithelial cells through an intermediate stage of phosphatide formation or phosphorylation. This temporary uptake of inorganic phosphate is controlled by adrenal cortex and catalysed by the enzyme phosphatase present in large amounts in the intestinal mucosa. Fat particles then pass into the blood stream *via* the lacteal lymphatic system.

Frazer[9] later advocated the partition hypothesis meaning thereby of two routes for fat absorption. The neutral fat is absorbed as such in the form of fine emulsified particles into the intestinal cells and passed on to the lacteals while the soluble 'bile acid-fatty acid complexes' pass directly from the intestine into the portal blood without passing through the lacteals. The important pre-requisite for direct absorption of neutral fat is its thorough emulsion into particles less than 0·5μ in diameter. The lipase has been said to act on triglycerides in stages splitting off successively each of the three fatty acid molecules. Fat digestion in normal subjects is incomplete and stops before 30% of fatty acids contained in triglycerides are released. Absorption may be influenced by local concentration of electrolytes, and adrenal cortex by regulating the electrolyte balance in the body fluids may have a regulating effect.

Liquid Paraffin—Frazer, Schuleman and Stewart[11] have shown that very finely emulsified liquid paraffin in which the particle size is less than 0·5μ in diameter can be absorbed to the extent of 36% to 43% by the rat intestine. There is, however, no evidence that the fine dispersion of paraffin which Frazer and his colleagues have shown to be necessary for its absorption takes place in the human intestine if it is taken by mouth in the normal way.

Defective fat absorption.—Normal subjects absorb more than 90% of common dietary fats. Defective fat absorption may be due to various causes. Frazer[10] attributes them to be of two types:

(1) Firstly—when the bile or pancreatic secretion is deficient as in chronic pancreatitis or obstructive jaundice, only 10 to 20% of the ingested fat may be absorbed. The fæcal fatty acids

resemble the dietary fat in composition. There is no evidence of abnormal gastric secretion or motility. An increase in the fat content of the diet is not associated with corresponding increase in the absolute amount of fat absorbed.

(2) Secondly—in the sprue syndrome (tropical sprue, cœliac disease and nontropical sprue) 50 to 70% of the dietary fat is absorbed. Biliary and pancreatic secretions are normal. The fæcal fatty acids are particularly rich in long chain components. Gastric secretion and motility are abnormally low. An increase in the fat content of diet is usually associated with a rise in the absolute amount of fat absorbed. In this type particulate absorption becomes defective. The pH of intestine is less subject to sudden changes. Intestinal bacterial flora changes occur secondarily and this may ultimately precipitate nutritional deficiencies.

Fat storage.—The triglycerides absorbed from the intestine pass into the circulation and cause the post-absorptive lipæmia (fattide). It is readily deposited in fat depots from which it is mobilized when necessary. It may also be directly deposited in the liver and various tissues in the body. Probably because of the fine emulsion in the blood stream, the triglycerides (chylo-microns) can diffuse through the capillary endothelium to reach the tissues.

The depot fat is composed almost wholly of triglycerides. It is derived partly from the fat in the diet and partly from fat synthesized from non-fatty sources in the body. Human fat depot contains[18] 24% of palmitic acid, 8% of stearic acid and 3% of myristic acid as its saturated components and 47% oleic acid, 5% of palmitolic acid, 10% of acids of linoleic type and 3% of C 20–22 acids as its unsaturated components. If fat of known melting point or known iodine value is ingested, the fat which is deposited in the depot closely resembles it in their characters. Thus a dog may be wrapped in the sheep's skin by dietary means.

It was previously believed that fats of the diets were directly metabolized and that only the excess of the energy requirements was stored in the tissues. Schœnheiwer and Rittenberg[14] by their experiments on mice with the aid of fats labelled with isotopic hydrogen have shown that depot fat is not an inert storage but is constantly involved in metabolic process. Even when fat is fed at a low level some of it is deposited in the tissues while some of the depot fat is utilized to meet the energy requirements.

Utilization of triglycerides.—The glycerol fraction of fat molecule is oxidised to glucose and used as such. Probably there is preliminary phosphorylation to form phosphoglycerol or phosphoglyceric acid both of which are intermediates in carbohydrate metabolism. Fatty acid fractions are broken down to aceto-acetic acid. The steps of oxidation of long chain fatty acids are not established. It is generally agreed that 'β-oxidation' is chiefly the process concerned. Oxidation takes place at the β-position splitting off a

2-carbon fragment and the production of a fatty acid with 2 fewer carbon atoms. The process continues along the chain until the entire fatty acid molecule is broken down to 2-carbon fragments by the removal of 2-carbon atoms at a time. The nature of the 2-carbon fragment is a matter of controversy. It has been suggested to be acetic acid, possibly in an 'active' form. These 2-carbon fragments then condense with one another to form the 4-carbon compound —aceto-acetic acid.

Jowett and Quastel[14] suggested the process of 'multiple alternate oxidation' for fatty acid breakdown. According to this concept the fatty acid is oxidised at every alternate carbon atom to form a succession of ketone groups. The chain is then split at every fourth carbon to give aceto-acetic acid molecules directly.

The long chain fatty acids are oxidised in the liver by an exothermic reaction to aceto-acetic-acid. Other ketone bodies such as β-hydroxybutyric acid (its equilibrium reduction product) and acetone (its decarboxylation product) are formed secondarily. The ketone bodies are passed *via* the hepatic vein into systemic circulation from where they are taken up by muscles, heart and other tissues and there oxidised by an exothermic reaction to yield energy CO_2 and water. The stages concerned in the breakdown of ketone bodies are not known. Some consider that a major metabolic pathway is by way of Krebs tricarboxylic acid cycle, possibly through reversible equilibrium with acetic acid.

Blood ketone level and ketosis.—Aceto-acetic acid is the normal end product of fatty acid oxidation in the liver. It is probably a normal intermediate in the process of fatty acid oxidation in other tissues. The intensity of ketone body formation in the liver is mainly a subject of substrate availability for the local oxygen supplies. In the absence of carbohydrate oxidation which the liver apparently prefers to oxidise as a source of energy, liver fat becomes the principal substrate for the available oxygen resulting in increased ketogenesis. If the peripheral tissues are unable to oxidise the ketone bodies as fast as they are formed, ketosis ensues. Increased ketone level in the blood arises under the following conditions :—

(1) Diabetes mellitus—where the liver glycogen level falls and the fat level rises resulting in increased oxidation of fatty acids in the liver.

(2) Starvation—when due to lack of carbohydrates, fats are chiefly used as a source of energy.

(3) After injection of anterior pituitary extract (ketogenic hormone) when there is increased mobilization of depot fat to the liver with excessive ketogenesis.

(4) On a diet poor in carbohydrates and very rich in fats. Ketone bodies are also formed in body from other sources.

It has been established that aceto-acetic acid is a normal intermediate in the process of breakdown of certain amino-acids such as leucine and phenylalanins. Pyruvates under certain circumstances have been shown to produce ketone bodies.

Role of fat in diet.—(1) Fats are an essential constituent of all cells in the form of phospholipine and cholesterol esters. These substances are synthesized in the body from ingested neutral fats. They are also present to some extent in the fat of the diet.

(2) Fat serves as a source of energy, 1 grm. of fat liberating 9·3 calories.

(3) Certain highly unsaturated fatty acids which cannot be synthesized in the animnl body which have been shown to be necessary for normal growth and tissue metabolism are supplied with the fat in the diet.

(4) The natural fats in the diet serve as a vehicle for fat soluble vitamins.

(5) Fat can be readily stored and thus constitutes the chief energy reserve of the body. The fat deposits of the body can increase almost infinitely, a condition which does not apply to carbohydrates or proteins. Excess of the latter are converted to fat and deposited in fat depots.

(6) Because of the very low specific dynamic action of fat, it raises the metabolism far less than proteins and carbohydrates.

(7) Fats are absorbed slowly from the gut and they have a satiety value in delaying hunger between meals.

(8) Fats as compared to carbohydrates are less subject to cause fermentation in the gut.

(9) Diets containing larger proportion of fats are less bulky since fats have more than double the calorific value of carbohydrates and proteins and fatty foods contain a lesser proportion of water.

(10) Owing to its lubricating effect, diets containing larger proportion of fat are eaten more easily.

Intercontrovertibility of carbohydrate of fat.—That fats are readily formed from carbohydrates in the body has long been recognised. Conversion of fatty acids into carbohydrates has however always been a matter of controversy. It has been demonstrated[5] by the use of isotopes that carbon of certain fatty acids are incorporated into glycogen of the animal body. Some believe that gluconeogenesis readily occurs from fatty acids and this is one of the important causes for development of hyperglycæmia in diabetes mellitus. It is, however, doubtful whether the altered metabolic state in diabetes causes or facilitates this neoglucogenesis.

Conversion of proteins to fats.—Certain amino-acids like leucine, tyrosine and phenylalanine are oxidised to aceto-acetic acid and this in turn may give rise to synthesis of fatty acids. Since protein

can be converted to glucose and glucose into fat, it is possible that fat may arise from protein in this way. The occurrence of these in normal nutrition is however doubtful. Glucose formed from protein is usually burnt and not stored as glycogen or fat.

Deposition of fat in liver.—On a normal mixed diet the liver contains about 3% of fat. The fat content of liver increases under the following conditions:—

(1) On a diet high in fat, particularly so when it is low in protein or choline.

(2) During increased mobilization of depot fat as in starvation, diabetes mellitus and after injection of pituitary extracts.

(3) In poisoning with some agents, such as phosphorus.

(4) Imbalance in dietary constituents. Animals develop fatty livers[14] in deficiency of essential fatty acids, of pantothenic acid or of riboflavine and also in excesses of thiamin and biotin. The important lipotropic agents which prevent deposition or reduces the amount of fat already deposited in the liver are choline, methionine, lipocaic, inosital and tryptophane.

The deposition of fat in the liver is of importance since fatty livers may lead to development of its cirrhosis. The important point arising out of it is how much fat the liver can tolerate and for how long before cirrhosis develops. Glynn and his colleagues[13] have shown that the critical stage is reached when the fat in the liver rises to 15% and that above this level the rate of fibrosis is proportionate to the fat content of the liver.

Essential fatty acids.—Burr and Burr[14] first demonstrated that the body cannot synthesize certain highly unsaturated fatty acids essential for nutrition. Thus rats placed on a diet devoid of fat but otherwise complete, failed to grow and showed some lesions on the skin and tail. The deficiency did not develop when small amounts of highly unsaturated fatty acids like linoleic or linolenic acid were added. These were confirmed by further studies. Arachidonic acid has been found to be more effective than other unsaturated fatty acids in promoting growth.

Nutritive value of different fats.—Works done on this subject have not so far proved that there is any significant nutritional difference between common animal and vegetable fats other than those that can be attributed to be due to their slight differences in digestibility and vitamin contents. There have been numerous controversial observations on the subject. In experiments on man[14] it was shown that hydrogenated vegetable oil was as satisfactorily digested and utilized as was lard and was less liable to cause gastric or intestinal symptoms of an objective nature. Deuel[14] has shown in his experiments on rats by replacement of whole milk powder of Sherman's whole milk powder-ground whole wheat basal diet by

skimmed milk powder and margarine fat that adequate growth and reproduction could be maintained for 13 generations. Deuel and his co-workers[6] made a series of observations which seem to show that rats grow equally well whether the fat used in the experimental diet is a butter, margarine, corn, cottonseed, peanut or soyabean oil. Boer and his co-workers[1], on the other hand, have recently reported from thier experiments on rats that vaccinic acid present in summer butter has growth-promoting properties and this is an evidence in favour of superiority of butter fat. Boutwell and his associates[3] consistently observed the superiority of butter fat to corn oil in effecting rat growth under certain dietetic conditions. Further researches are necessary on this subject before a more definite conclusion can be reached.

Artificial fats[18] have been produced in Germany at various times since the first World War from acids formed by catalytic oxidation of petroleum. By repeated purification it has been possible to produce tasteless fat which is harmless when consumed in small quantities. A high cost is however involved in this process of production and further studies are needed before they can be recommended for general use in human nutrition.

Dietary fat and vitamin requirements.—Mannering[16] has shown that riboflavine requirement of the rat is considerably increased with fats at a level of 25 and 40 per cent of diet. This may probably be due to altered intestinal bacterial flora with the high fat diet leading to impaired biosynthesis of riboflavine.

The dietary fat is considered to have a sparing action in connection with certain vitamins—such as thiamin, nicotinic acid and adrenin. Salmon[19] has demonstrated that nicotinic acid deficiency develops more readily in rats on a low fat diet and that 30% fat in the diet tends to counteract the deficiency. It has been seen that acrodymia associated with vitamin B_6 deficiency[7] becomes more marked when fat is omitted from the diet. Certain fatty acids like linoleic acid are specially important in this respect.

There is evidence in support of the view that tricarboxylic acid cycle is a pathway for oxidation of fatty acids as well as carbohydrates. If this is the case, thiamin becomes as important in fat metabolism as in carbohydrate metabolism.

The requirement of choline and other lipotropic agents increases with high fat diets to prevent the development of fatty changes and necrosis of the liver.

Fats in economy of food utilization.—Forbes and his associates[8] suggest that on a fixed diet containing fat, animals have extra calories for work, storage and growth and these extra calories are not available when fat is replaced by a isocaloric mixture of carbohydrate and protein. As 30% of fat was compared with a 2% fat in the diet, the retention of nitrogen as tissue protein was higher by

more than 10% in the former. Schantz and his co-workers[20] have showed that 3 to 4% of fat naturally present in milk is necessary to the animal for complete utilization of lactose or more specially galactose. Geyer and his associates[12] also conclude from their experiments on rats that fats in some may influence galactose utilization.

Dietary fat deficiency.—In young rats, the deficiency of essential fatty acids has been found to cause (as already described) cessation of growth and some skin lesions. Infants were found to develop eczema[15] on a very low fat diet by two different workers. There is, however, no conclusive evidence that unsaturated fatty acids (linoleic, linolenic and arachidenic) are essential for health in man. Brown[4] in his very low fat diet for 6 months did not show any untoward manifestations. Six months in the life of a man, however, corresponds to a week in rat's life and it is possible if Brown had continued his diet longer, some deficiency manifestations might have been observed.

If the fat content of the diet falls very low, deficient calorie intake may result and this may lead to the development of famine œdema. This is why fat deficiency is considered as one of the causes of famine œdema. Cases of famine œdema have recently been divided into two groups.[21] In one there is hypoproteinæmia and in the other the protein content of blood is within normal range and in this group there is probably increased re-absorption of water from kidney tubules.

Rancid fat.—When fat is kept for a sufficient length of time in contact with air and moisture, particularly in the presence of light and heat, certain chemical changes take place and the fat becomes rancid. The exact chemical processes concerned in the processes of rancidity are not known. The unsaturated fats, particularly those containing oleic acid become rancid more rapidly than saturated fats Rancid fats[14] are unpalatable, slightly toxic to some individuals and there is destruction of vitamin A and vitamin E in rancid fats. The process is associated with intense peroxide formation and it is believed[7] that intermediates of fatty acid peroxidation are the more important agents concerned and not the peroxides themselves in destruction of vitamin A.

Intravenous alimentation of fat[18].—Attempts have been made to prepare suitable fat emulsions that can be administered intravenously. Such emulsions should be stable, compatible with glucose and proteins for simultaneous administration and should not cause reaction in the body. Olive oil emulsified with either diluted plasma protein or a combination of dextron and Soyabean phosphatides is reported to have given promising results in this direction.

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Glaucoma and Orally Administered Belladonna

Mossman and Ullman report six cases to whom extract of belladonna, or tincture belladonna was given for gastro-intestinal ailments, (*e.g.*, duodenal ulcers, peptic ulcers, spastic or ulcerative colitis, hyperacidity or psychosomatic complaints) centred in the gastro-intestinal tract. The patients were in the glaucoma age group (40 to 68) and 5 of the six had narrow filtration angles. Since the authors did not examine any of these patients before the medicament was given no statement on whether the drug or any specific dosage of it had caused glaucoma can be made, but in all cases the taking of the drug was followed within a few days to several weeks by ocular symptoms of which the patients had not been previously aware. The physicians who administered the drugs did not appear to have questioned the patients about past eye diseases or eye treatment. It did not occur to the authors prior to their first case to question the patients as to medicaments that had been used prior to the eye examination. The authors cite facts and figures which suggest that approximately *one fourth of their cases of primary glaucoma were induced or aggravated by the administration of belladonna.* In this article Ullman and his co-workers discuss at length about glaucoma due to the topical use of mydriatics and they point out that the literature contains no reports correlating glaucoma with orally administered belladonna.—*Am. Jour. Ophthalmol.*, Vol. 33, pp. 757–763, 1950.

ANTIBIOTICS*

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WITH the advent of antibiotics a whole group of infections came under reasonable control. Of the various antibiotics which have been discovered Penicillin, Streptomycin, Aureomycin and Chloromycetin have established themselves. Tyrothricin is of some value for local application. Others like Terramycin may prove to have a place in clinical medicine. They are of the utmost value in the practice of otolaryngology and the methods for their administration are many and varied. Aerosolization, nasal inhalation and instillation, lozenges, ointments and drops are some of the methods of local administration of these drugs.

These although capable of almost unbelievable good are not without their dangers and they are bringing new problems to the practice of medicine. Many have felt that the range of effectiveness of the antibiotics is so great that much of the burden of diagnosis has been eliminated, that in effect they constitute a cure all. Far from being the case accurate diagnosis remains just as important as ever and sometimes even more so. Every one knows about these antibiotics and most lay persons have the idea that their powers are limitless and that one can cure himself of practically anything. When they are so useful why bother to spend money for medical diagnosis. Since the specialist also prescribes the same one might as well do the same. Unfortunately this is a mistaken view point, because accurate diagnosis is the basis of all sound treatment. Once the diagnosis is made the appropriate drug should be given in adequate dosage and the full course of treatment continued for the necessary period to ensure a cure. Inadequate thearpy leads to development of resistant strains of bacteria and the masking of the symptoms. This is dangerous particularly in acute middle ear and mastoid disease as they lead to symptomless complications. So it is better for us to err on the side of giving larger doses than may be deemed necessary rather than run the risk of complications or failure to cure that may follow small doses. Further these are bacteriostatic rather than bactericidal. Therefore these drugs should be administered at frequent intervals and for a period long enough to impair the vitality of the organisms so that their destruction can be completed by the natural defences of the body. To give the patient with ear discharge a few injections or tablets and the patient with tonsillitis a few lozenges is criminal neglect of fundamental therapeutic principle. There are certain principles which should be constantly kept in mind if one wishes to administer these drugs in a rational and scientific manner. The first principle is they should be used against organisms for which they are specific. The vast majority of patients with acute suppurative otitis media,

* Specially contributed to THE ANTISEPTIC.

furunculosis of the external ear, acute sinusitis, tonsillitis etc., will respond promptly and effectively to parenteral use of Penicillin. The isolation and identification of the causative organisms in every case of infection is hardly feasible and practicable in every day practice. When, however, a definite clinical response to the antibiotic is not promptly observed the organisms must be identified and their sensitiveness determined.

The second principle is, to be effective the drug must come in actual contact with the organisms and maintain a sustained contact. The difficulty of applying this principle to the upper air passages is accountable perhaps to the disappointing results observed from the popular methods of topical applications. Indiscriminate use of these drugs in the form of sprays, lozenges etc., in the nose and throat is positively harmful in the absence of infection. The normal flora of the throat may be altered to include harmful organisms. Moreover prolonged administration of the antibiotics may produce resistant organisms which fail to respond to the same antibiotic at some subsequent time when it may be sorely needed.

For many of the lower respiratory tract infections Penicillin ærosal has been very much popularised but the results are not very encouraging. We find that local instillation of Penicillin through the bronchoscope in cases of bronchiectasis and lung abscess is sometimes followed by very marked improvement.

Another principle pertaining to the use of antibiotics is that they are not effective when inflammations have progressed to suppurations, or when used in the treatment of chronic conditions of the ear, nose and throat. They do not permit the violations of sound principles of surgery. Operative measures are imperative if one hopes to obtain a cure although an antibiotic may be an exceedingly important supportive measure both before and after the operation.

In otolaryngological practice Streptomycin has a great value in the treatment of tuberculous mucous membrane lesions. In addition we have used Streptomycin in rhinoscleroma and ozena with very gratifying results. The toxic effects of Streptomycin have themselves been turned to good account in the treatment of Meniere's disease. Four grams daily are given for about a week in an attempt to perform a chemical destruction of the labyrinth. The labyrinth is destroyed and the hearing is but little affected. This is in contrast to the attempted surgical methods of destroying the labyrinth which produces deafness as well.

Aureomycin and Chloromycetin have a wider range of activity than any other antibiotics known and bacteria seldom acquire any important degree of resistance to them and they do not give rise to any serious toxic effects. However, unless the organisms are resistant, Penicillin is still preferred on the score of economy and also because the former objection to Penicillin that frequent injections are needed has largely been overcome by the introduction of slowly absorbed preparations.

In conclusion I should like to particularly emphasize the following factors in the use of antibiotics :

(1) Accurate diagnosis is the basis of all sound treatment.

(2) When antibiotics are indicated an adequate dosage should always be given. Inadequate therapy leads to development of resistant strains of bacteria and the making of symptoms. To avoid this it is better to err on the side of giving large doses than may be deemed necessary rather than run the risk of complications.

(3) They do not permit the violation of sound principles of surgery.

(4) Indiscriminate use of these in the nose and throat in the form of sprays, lozenges etc., is positively harmful in the absence of infection as the bacterial flora of the throat may be altered to include harmful organisms.

Combined Streptomycin and Paraaminosalicylic Acid

A comparative study of four dosage schedules in 283 patients was carried out at the United States Army Tuberculosis Centre, Fitzsimons Army Hospital, during the past four years. In each schedule the patients were treated for 120 days. The four groups consisted of 66 patients who received streptomycin, 1 or 2 gm. daily ; 25 who received paraaminosalicylic acid, 12 gm. daily ; 97 who received streptomycin intermittently, 1 or 2 gm. every third day, and 95 who were treated on a combined regimen of streptomycin, 1 to 2 gm. every third day, concomitantly with paraaminosalicylic acid, 12 gm. daily. The patients on each regimen were similar with respect to age, sex, race, and duration, extent and type of disease. All patients had moderately or far advanced pulmonary tuberculosis and had received no prior antituberculous drug therapy. Clinical, roentgenographic, bacteriologic, and drug toxicity factors were evaluated after 120 days of treatment. Clinical response, in terms of reduction of fever, reduction of sputum volume, and weight gain, was equivalent on all four regimens. Of patients with roentgenographic evidence of cavitation when therapy started, the cavities disappeared in not more than 20·5% after 120 days of therapy. The best reults and the highest incidence of sputum conversion were obtained with the combined intermittent regimen (streptomycin every third day, paraaminosalicylic acid daily). No instances of bacterial resistance occurred with this regimen, compared with 75·9% after daily streptomycin, 33·3% after daily paraaminosalicylic acid and 33·3% after intermittent streptomycin regimens. The high incidence of toxic reactions (57·5%) that resulted when streptomycin was given daily decreased to 5% when the drug was given every third day for a similar period. The incidence of toxicity when paraaminosalicylic acid was given daily was also 5%. The higher incidence of toxic reactions (13·1%) that resulted when the two drugs were given together was not sufficient reason to discontinue the regimen except in four instances. Results were evaluated 60 days after the 120 day courses of therapy, because in this period it was frequently necessary to supplement the prior treatment with treatment (drug therapy) or operative procedures. Clinical relapse was approximately equal (15·1 to 22·2%) on each of the regimens. Roentgenographic relapse varied from 0% in the daily paraaminosalicylic acid group to 14·8% in the daily streptomycin group. Bacteriologic relapse ranged from 5·5% in the daily paraaminosalicylic acid series to 31·2% in the combined intermittent regimen. A loss of bacterial resistance to one or the other of the drugs was observed ; this was pronounced in the daily paraaminosalicylic acid regimen and indicates that resistance may be less permanent to this agent than to streptomycin. The regimen of choice for periods up to four months when specific drug therapy is indicated for the treatment of nonmiliary pulmonary tuberculosis is a combined intermittent regimen of streptomycin administered every third day and paraaminosalicylic acid daily.—*J.A.M.A.*

PROGRAMME FOR THE EYE SIGHT PRESERVATION DAY IN SCHOOLS*

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Introduction.—The main causes of preventable blindness fall within the ambit of preventive medicine and therefore, in order to control and check the ever increasing incidence of eye diseases among the students, there is an urgent and immediate necessity for observing an eye-health-programme in schools and colleges which could provide for every child a thorough examination and continuous supervision of the eyes. In any compaign for sight conservation in teaching institutions it is important to determine defective vision, eye diseases and the possibilities of their correction and to analyse results for guidance of school and health authorities as the necessity for providing facilities for treatment can only be realised when its wide-spread necessity is definitely known and its importance realised by the Government and the public alike.

To enable a teacher to hold an eye test of his students with the help and assistance of medical social workers, this has been prepared. It will instruct him how this test is to be carried out. For a class of about 30 students, an hour and a half would be quite enough to test, record and prepare reports to be sent to the parents. In this way the sight testing of all the students in a school can be done in about two hours if all the teachers set to work simultaneously. All these tests are conducted under direct supervision and guidance of an eye surgeon. The observance of this programme may be known as the "Sight Preservation Day" in school. This day should be observed annually, shortly after the beginning of each school session and should be an integral part of the general school programme. On this day the educational programme should be omitted until the tests and records have been completed.

This programme also helps the general public as through the student we can reach his whole family. Every time a child reports to his parents that the school authorities have checked his vision or advised care of the eyes, they are reminded of the importance of keeping the eyes fit. The father and the mother of the child may become conscious of early symptoms of eye trouble in themselves and be stimulated into seeking medical advice. Thus through the school it is possible to create a greater awareness of the need for proper eye care.

Object.—The object of an "Eye Sight Preservation Day in Schools" is merely to discover the fact that a child has defective vision or symptoms of any eye disease rather than to determine the

* Specially contributed to THE ANTISEPTIC.

degree of deficiency and to analyze the results for the guidance of school and health authorities.

Method.—It is necessary to secure the active co-operation among parents and school authorities on the one hand, and the examining eye doctor and the school health officer on the other. Parents and teachers often know of certain pupils suffering from symptoms due to eye strain or who are actually having poor visual acuity. They may have observed that certain children hold their books too close, sit in a stooping position at the desk, are not able to see the black board, are backward in their studies or make mistakes in reading. Teachers can easily note that certain students are cross eyed or have eye diseases. Such students should be very thoroughly examined by the eye surgeon. From those who are already wearing glasses, it is important to find out when and where the correction was obtained, the thoroughness of examination how long the correcting lenses have been worn and whether they have accomplished the purpose for which they were intended. Although a child may have normal vision, evidence of ocular fatigue may be outstanding. Such symptoms are headaches, frowning, blurred vision at times, blinking and rubbing of the eyes, frequent styes blood shot eyes etc. Such defects may not be indicated by vision below normal and cannot be detected except by one skilled in eye work or one who remains in constant touch with the students.

The following directions are intended to make clear how tests are to be conducted, defects recorded and recommendations sent to parents or guardians:

Preparation.—In advance of the eye sight preservation day, each class teacher should have a complete set of all necessary forms properly filled out with the name and address of each pupil in the class.

A suitable place for the tests should be selected and the testing distance of 20 feet should be accurately marked out and a tack placed where the chart may be hung.

Snellen's distance chart is to be used for those children who can read, followed by a test and recording of near vision with a reading chart at about 13 inches. For younger children who do not know their letters, "E" chart must be used. The examiner should see that the examination is made in good day light. If good day light is not available then artificial light properly shaded should be used. The pupil should sit in a chair placed at the eye test line 20 feet from the chart and directly in front of it.

Actual test.—(*a*) Each eye should be tested separately, starting with the right eye, the other being completely covered with a card or a slip of stiff paper so as not to press upon the eye ball. This is important as the pressure may induce incorrect answer.

(*b*) The pupil should start at the top of the chart and should read down from left to right.

(*c*) The degree of acuteness of vision is determined by the smallest letters that can be read by each eye separately at 20 feet distance from the chart. To illustrate, if with the right eye (the other covered) all the letters in line 7 can be read without mistake, the right eye has normal vision *i.e.* $^6/_6$. If the left eye is similarly tested (the right eye covered) and found to see not better than the letter on line No. 5, then the left eye has $^6/_{12}$ vision as indicated by the figures above that line of letters. It is recorded as follows:—R.E.V. $= ^6/_6$. L.E.V. $= ^6/_{12}$.

Types of acuteness of vision.—TYPE A:—A record of $^6/_6$ in each eye separately and not accompanied by any symptoms of eye strain is normal vision. It is to be recorded as follows:—

R. E. V. $= ^6/_6$. L. E. V. $= ^6/_6$.

TYPE B.—A record of $^6/_6$ does not indicate normal vision if accompanied by symptoms of eye strain. The evidence of eye strain is designated by the symbol "S" and will be recorded as follows:—

R. E. V. $= ^6/_6$ (S). L. E. V. $= ^6/_6$(S).

This indicates normal acuity of vision plus eye strain and will need a thorough examination and treatment.

TYPE C:—A record of less than $^6/_6$ in one or both the eyes indicated defective vision. It is to be recorded as follows:—

$^6/_{60}$, $^6/_{36}$, $^6/_{24}$, $^6/_{18}$, $^6/_{12}$, $^6/_9$.

Recording of results of observations.—Perfect records are important and helpful. It is necessary that records of all tests of vision etc., be preserved so that as the child advances from class to class, the teacher and the school health officer will have record of the child's previous examinations.

Record each child's acuity of vision in the cards and also note the presence of eye strain such as cross-eyes, headaches, frowning, sensitiveness to light, weariness after studies or red congested eyes.

Notification and follow-up.—In cases where defective vision, muscle defect, or eye diseases is discovered, it is absolutely essential to have proper follow-up of the cases. Parents should be notified about the result of the eye test and requested to put their children under proper treatment. Children for whom spectacles or eye treatments are advised also require follow-up to make sure that such spectacles or treatment are obtained. To accomplish this, a list of such pupils should be made for whom the eye surgeon has made definite recommendations, in order to check from time to time whether the advice has been carried out.

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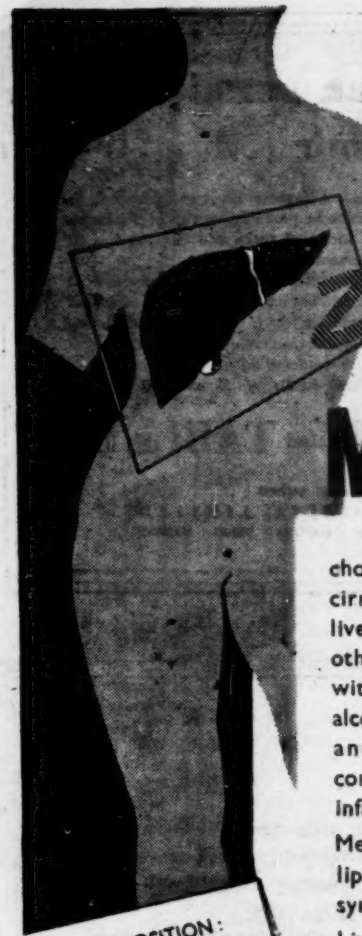

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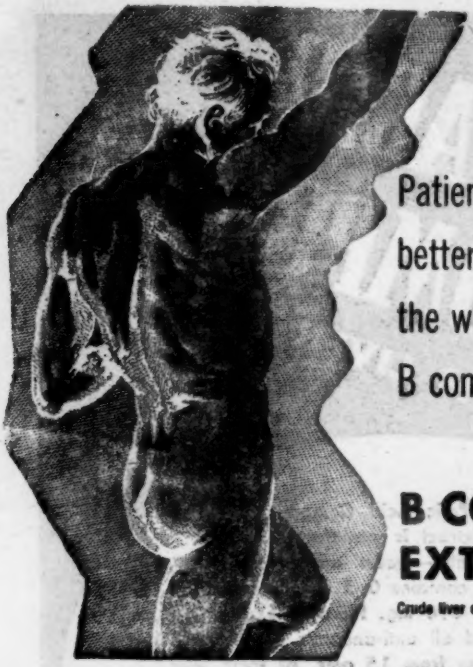

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Vision Record Card

Name of the student.....
Age.....
Father's name.....
Address.....
First year of Test.....

Year	Age	Vision without glasses	Vision with glasses	Any disease of the eye

Notification Card

Notification to parents or guardians.

Date.....

An eye test made of Shri.....indicates defect in the eyes.

A thorough examination should be made by an eye specialist. It is earnestly recommended that prompt attention be given and any defect that may exist be remedied so that the student may not be handicapped in his studies on account of defect in his eyes.

Head Master.

Chart on which Preliminary Test should be entered

Date.....

Class.....Section.....

No.	Name of student	Age	Vision without glasses	Vision with glasses	Any disease of the eye

Signature of Examiner.

Final Results of Tests conducted on Sight Preservation Day

Class.....Section.....
Date of examination.....No. of students examined.....

Age of students	Number	Type A	Type B	Type C	Any eye disease
5 to 10 years					
11 to 15 ,,					
16 to 20 ,,					
21 to 25 ,,					
Above 25 years					

Signature of Examiner.

A NEW APPROACH TO PATHOLOGICAL PROCESSES AND THERAPEUTIC POSSIBILITIES*

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"Ah, but a man's reach should exceed his grasp,
Or what's heaven for ?.....". —*Robert Browning.*

Introduction.—The writer expressed thus in 1938 : "A venturesome statement will be that specialised derivatives from one germinal layer are concerned with the maintenance of normal health and the rearing up of natural immunity of the other tissues and organs derived from the same germinal layer," and since then set his thinking on the ideas more fully expressed below in this communication.

The human body is developed from the zygote endowed with the potentialities of its parents and the capacity of producing a new member of the species. The zygote develops into the morula which reveals the outer trophoblast, and the inner cell mass. The ectoderm, mesoderm, and entoderm recognisable in the inner cell mass give rise to the organs and tissues of the entire system constituting the human body.

"A thing of beauty is a joy for ever;
Its loveliness increases ; it will never
Pass into nothingness ;.....". —*John Keats.*

And even so a thing of originality is an attainment for ever ; it grows from strength to strength ; and it shall live for ever inspite of storms of criticisms, which will only season the inherent texture. With the above inspiration, courage and above all conviction, the writer sets forth two hypotheses.

Hypothesis "A"

The writer offers the following hypothesis as the important factor governing the pathological processes in the body. In any naturally occurring disease, degeneration or defect, all derivatives of any one embryonic layer are vulnerable to morbidity, while the maximum manifestations may be only in one or more of them. Therefore pathological changes can be predicted in disease or degeneration, or congenital defect, while we are able to perceive only the field of maximum incidence of damage or injury. Therefore pathology demands to be appreciated as of ectodermal, mesodermal, and entodermal structures. The writer ventures and desires to allocate to this hypothesis a status analogous to the periodic classification in chemistry. (*Diagram to explain thesis "A" vide page 917*).

* Specially contributed to THE ANTISEPTIC.

ANTERIOR PITUITARY
NON-ENDOCRINE TISSUES OF ECTODERMAL ORIGIN
ENDOCRINES OF ECTODERMAL ORIGIN
NON-ENDOCRINE TISSUES OF ENTODERMAL ORIGIN
ENDOCRINES OF ENTODERMAL ORIGIN
NON-ENDOCRINE TISSUES OF MESODERMAL ORIGIN
ENDOCRINES OF MESODERMAL ORIGIN

HYPOTHESIS "B"

Diagrammatic representation.

PATHOLOGICAL LESION
NON-ENDOCRINE TISSUES OF ECTODERMAL ORIGIN
ENDOCRINES OF ECTODERMAL ORIGIN
NON-ENDOCRINES OF ENTODERMAL ORIGIN
ENDOCRINES OF ENTODERMAL ORIGIN
NON-ENDOCRINE TISSUES OF MESODERMAL ORIGIN
ENDOCRINES OF MESODERMAL ORIGIN

HYPOTHESIS "A"

Diagrammatic representation.

Hypothesis "B"

That one or more of the endocrine tissues (master tissues) developed from ectoderm, are endowed with the functions of governing and protecting, in health and disease, the other tissues and organs (subordinate and target tissues) derived from ectoderm, their common parent, is also another hypothesis released in this communication. Analogous functions are attributed to the endocrine tissues derived from mesoderm and to those from entoderm. (*Diagram to explain thesis "B"*).

Hypothesis "A"—Elaboration

The following table (*vide page 919*) explains how pathology is dominant in derivatives of one or other germinal layer.

Table to explain Thesis "A"

The thesis of Selye and elaboration by Boland regarding the diseases of adaptation have evoked in the writer keen interest and the present communication by the writer is a support for the great work at least as far as importance of the adrenal cortex is concerned.

Hypothesis "B"—Elaboration

The endocrine glands are the pituitary, adrenals, thyroid, and parathyroids, while the liver, pancreas, and the intestinal mucosa and the gonads own an internal and external secretion. The pineal and the thymus appear to exert an influence on the racial development.

According to the writer, an entodermal contribution to the anterior pituitary is possible from the nearest entodermal cells lining the primitive foregut (*vide diagram*) and a mesodermal contribution from the adjacent notocord.

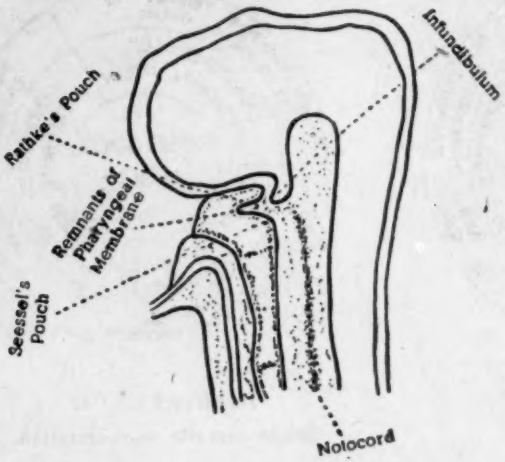

DIAGRAM TO SHOW SECOND STAGE IN THE DEVELOPMENT OF THE PITUITARY.
[AFTER MIHALKOVICS AND HERRING]
From: *"The Pituitary"*—By W. Bell. (1919).

The following table *(vide page 919)* shows the writer's anticipations in the therapeutic field. Table elaborating Hypothesis "B".

Cortisone is now a centre of therapeutic attraction. According to Hench, cortisone produces remission in renal diseases, ulcerative colitis and asthma; symptomatic relief in tuberculous arthritis; subjective improvement in pulmonary tuberculosis; and considerable relief in gouty arthritis and osteoarthritis. Inflammatory diseases of the eye like subacute uveitis and iridocyclitis are also benefited.

Recent chemotherapy with Sulpha drugs and antibiotics has revealed resistant strains of bacteria and the writer suggests that especially in such cases hormonal therapy would form a very effective and useful support.

The writer stresses that the human body be viewed more to achieve fortification of its soil both in the prevention and in the treatment of disease that gets sown in the soil of the tissues. Many conditions of vague ill health may become realised as due to varying degrees of functional or organic derangement of one or more of the master tissues (endocrine elements) of the body, and in future therapy would include hormones in many acute and chronic diseases. The fertile support to the soil is in the anterior pituitary and the adrenal cortex.

"Be through my lips to unawakened earth
The trumpet of a prophecy !....."

—*P. B. Shelley.*

Table Elaborating Hypothesis "A"

No.	Disease	Lesions in ectodermal derivatives	Lesions in mesodermal derivatives	Lesions in entodermal derivatives	Writer's anticipation
1	Vitamin A deficiency.	Night blindness, dermatitis, xerophthalmia, and atrophy of enamel of teeth.	...	...	...
2	Vitamin B^1 deficiency.	Microscopic nerve lesions in vagus, phrenic and cranial, and peripheral nerves.	...	...	..
3	Vitamin C deficiency.	...	Failure of malnutrition of mesodermal cells, and impaired immunological and detoxicating functions.	...	Adrenocortical failure.
4	Vitamin D deficiency.	...	Rickets, osteomalacia, osteoporosis, dental caries.	...	...
5	Vitamin E deficiency.	...	Muscular and testicular atrophy.	...	...
6	Toxins of tetanus and diphtheria.	Fix to nerves.	...	...	...
7	Sarcomata ..	...	Malignancy.	...	...
8	Carcinomata ..	Malignancy.	...	Malignancy.	...
9	Septicæmias ..	...	Splenomegaly; inflammations in serous membranes, joints, kidneys, bones and endocardium.	...	Adrenocortical damage.
10	Infective granulomata.	...	Granulomatous lesions in the fixed connective tissues.	...	Do.
11	Protozoan illnesses.	...	Lesions in reticuloendothelial system.	...	Do.
12	Spirochætal illnesses.	...	Lesions in the connective tissues, and granulomatous with lymphadenitis.	...	Do.
13	Rickettsial, and viruses of glandular fever, acute infections, lymphocytosis and bartonellosis.	...	Lesions as in septicæmic illnesses.	...	Do.
14	Lymphogranuloma venereum.	...	Lymphatics.	...	...
15	Infective hepatitis, yellow fever, influenza, cold, psittacosis, pneumonia.	...	...	Liver or lungs	...
16	Yellow fever ..	Neurotropic.	...	...	...

Table Elaborating Hypothesis "A"—*(Contd.)*

No.	Disease	Lesions in ectodermal derivatives	Lesions in mesodermal derivatives	Lesions in entodermal derivatives	Writer's anticipations
17	Viruses of variola, vaccinia, chicken-pox, Herpes simplex and zoster, morbilli, mumps, lymphocytic choriomeningitis, polioencephalitis lethargica, and rabies.	Neurotrophic First six or also Dermatotrophic.	...	...	...
	Molluscum contagiosum.	Dermatotrophic.			
18	Rheumatic fever.	...	Damage to interestitial and supporting tissues—collagen and elastica—all the derivatives of mesoderm are susceptible to damage.	...	Adrenal cortical damage. Involvement of pleura, peritoneum hepatic vasculature, intestinal musculature, kidneys, and gonads to be recognized.
19	Nephritis.	...	Diffuse capillaritis typified in kidneys, and involvement of serous membranes.	...	Lesion in adrenal cortex. Gonadal damage. Anæmaia in nephritis and rheumatic diseases seem to be due to bone-marrow damage.
20	Blood dyscrasias.	...	Manifestations in pernicious anæmia, purpura, hæmophilia, and leucoses are in bones and bone marrow.	...	...
21	Rheumatoid arthritis, and Still's disease.	...	Allergic etiology. Benefit from cortisone therapy.	...	Lesion in adrenal cortex.
22	Gout.	..	Cardio-nephritic involvement.	..	Do.
23	Congenital heart disease.	..	...	...	Do.
24	Epiloia.	Tuberose sclerosis of brain and adenoma sebaceum.	...	...	...

Table Elaborating Hypothesis "A"—*(Contd.)*

No.	Disease	Lesions in ectodermal derivatives	Lesions in mesodermal derivatives	Lesions in entodermal derivatives	Writer's anticipations
25	Diabetes mellitus.	...	...	Hepatitis and pulmonary catarrh or suppuration are common.	...
26	Hepato-lenticular degeneration. Hepatorenal syndrome. Pick's disease.	...	...	...	Allergic basis. Adrenocortical lesion.
27	Renal rickets.	...	Renal and skeletal damage.	...	...
28	Fibrocystic disease of pancreas.	...	...	Associated lesions are present in the lungs, bronchi, gall bladder and bowel. (Farber).	Whenever a congenital malformation is seen in any organ search of associated deformities in the other derivatives of the parenteral germinal layer.
29	Polycystic kidneys.	...	...	...	
30	Peptic ulcers.	...	...	...	Ulcers in respiratory and biliary passages.
31	Idiopathic steatorrhœa of adults, cœliac disease and sprue.	...	...	...	Damage in lining membranes of trachea, bronchi and lungs. Liver and pancreas.
32	Hepatic cirrhosis.	...	...	...	Allergic basis and adrenocortical damage.
33	Asthma, vertigo, sleeplessness, and schizophrenia syndrome. (Elaborated by the writer).	...	...	...	Do.
34	Allergic Pachymeningitis, pericarditis, pleuritis, peritonitis, orchitis, and oophoritis.	...	...	...	Do.
35	Hæmorrhagic small pox; severe enteric infections, pneumonias, diphtheria, blood diseases.	...	...	...	A condition like waterhouse Friderichsen syndrome possible.

Table Elaborating Hypothesis "B"—The writer's anticipations in endocrine therapy

Ectodermal endocrine derivatives	Diseases benefited by ectodermal endocrine derivatives	Mesodermal endocrine derivatives	Diseases benefited by mesodermal endocrine derivatives	Entodermal endocrine derivatives	Diseases benefited by entodermal endocrine derivatives
Pituitary and cromaffin tissues.	Virus diseases like variola, encephalitis complicating viral infections. Varicella. Herpes simplex and zoster. Morbilli. Rubella. Epidemic parotitis. Lymphocytic meningitis. Polio. Encephalitis lethargica. Yellow fever. Rabies. Tetanus.	Adrenal cortex and gonadal hormones.	Septicæmic illnesses. Infective granulomata. Protozoal and spirochætal illnesses. Rickettsial illnesses. Lymphogranuloma venereum. Rheumatic diseases. Allergic disorders. Cardiac and other muscular degenerations. Nephritis. Blood diseases. Muscular dystrophies.	Insulin. Thyroid. Parathyroids.	Infections, inflammations and degenerations of respiratory and digestive lining membranes. Peptic ulcers. Hepatitis. Pancreatitis. Cholecystitis. Prostatitis.

The writer is indebted to Dr. P. R. Kalyanasundaram, M.B., B.S., Superintendent, Government Royapettah Hospital, Madras, for all the encouragement received.

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Lipoid Pneumonia Caused by Mineral Oil Laxatives

Baron presents histories of six patients in whom necropsy revealed lipoid pneumonia. He classifies lipoid pneumonia as a man-made disease. Oil in nose drops, in vitamin preparations, or in a mineral oil laxative can cause this condition. Cases of lipoid pneumonia in children are understandable in view of the fact that the administration of oily vitamin preparations is frequently accompanied by strugglings and possible aspiration. Most fish oils and free fatty acids are irritating to the lung tissues. Mineral oil is not assimilable; being a saturated hydrocarbon, it cannot be digested in the body. So it remains in the lung indefinitely; only small amounts appear in the sputum. Anatomic defects in the mouth, tongue, larynx or œsophagus, swallowing difficulties, forced feeds, all these predispose to the aspiration of oil. When mineral oil reaches the dependent portions of the lungs, it first remains free in the alveoli but is later picked up in droplets by the macrophages. Some of the mineral oil can be disposed of in the sputum but the bulk remains in the lung indefinitely and causes the development of fibrous tissue. The lesion thus produced can be detected by the X-rays. The lower lobes, particularly the right, are most likely to be involved. The abnormal lung is a fertile soil for repeated attacks of bronchopneumonia which may be responsible for the death of the patient. All the six cases reported on by Baron, had received mineral oil as a laxative, though death had been caused by other conditions. Since oil cannot be removed from the lungs, prevention is the only treatment. Laxatives containing mineral oil *should not be used* nor should oily nose drops be instilled in the respiratory tract.—(*Virginia Medical Monthly*, 77, 1950, pp. 445–451).

OBSERVATIONS ON PSEUDO - HYPERTROPHIC MYOPATHY

A. V. S. SARMA, M.B., B.S., D.C.H. (Eng.), F.D.S. (London),
Honorary Physician, Government Royapettah Hospital, Madras, India.

PSEUDO-HYPERTROPHIC myopathy is characterized by progressive weakness and wasting of muscles, though with an initial increase in the size of some muscles. No primary changes are seen in the nervous system. The condition is attributed to poor muscular fixation of creatine and by Boyd to pituitary disturbance.

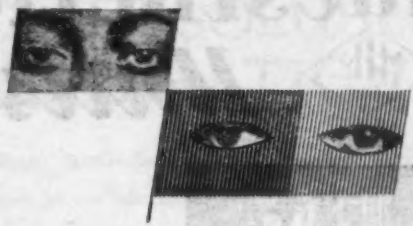
AETIOLOGY.—Victims are children usually with preponderance in boys and said to be escaped by women who transmit the disease to their male children.

Morbid anatomy.—The muscle fibres increase in size in the "Pseudohypertrophy" with increase in fibro-fatty tissue. In the atrophied muscle fibres, nuclei are more in number.

SYMPTOMS.—The patients are noticed to exhibit clumsy progression. The calf muscles and infraspinatii appear hypertrophied as also frequently quadriceps extensor, gluteii and triceps. Latissimus dorsi and lower pectoralis major are always atrophied and commonly also erector spinæ and trunk muscles, flexors of knee, peroneii, and biceps. Facial, fore arm and hand muscles escape.

Vaidyalingam, Male, 20.
Pseudo-hypertrophic Muscular Myopathy.

Rajamma, Female, 28.
Pseudo-hypertrophic Muscular Myopathy.



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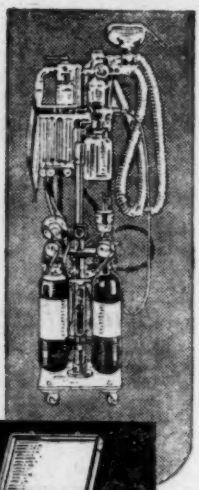

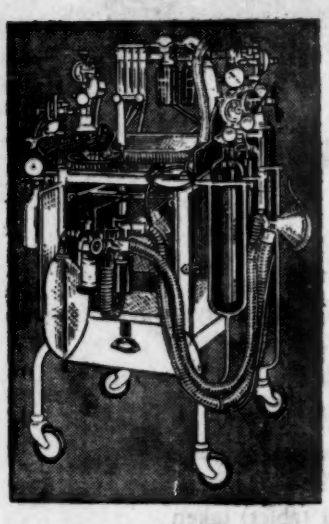

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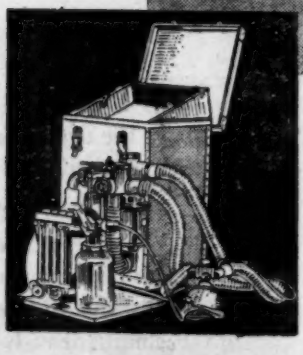

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Calcium Pantothenate	5 mg.
Sodium Glycerophosphate	gr. 1
Potassium Glycerophosphate	gr. 1
Calcium Glycerophosphate	gr. 1
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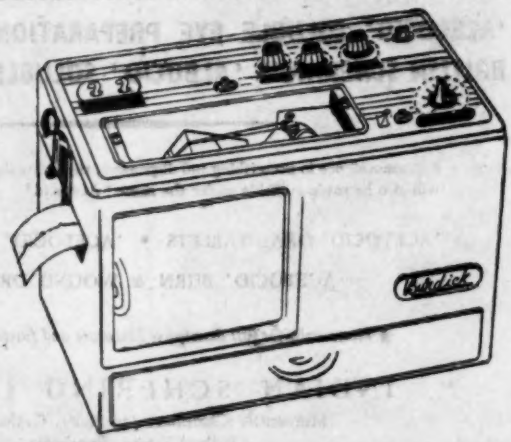

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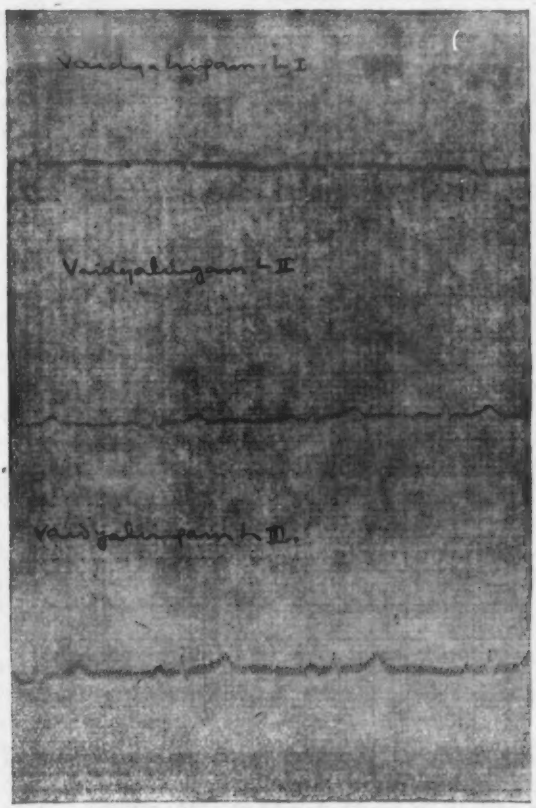
The patient has generally lordosis (Vaidyalingam and Rajamma —*clinical photographs, vide page 924*) and protuberant abdomen. Waddling gait and Gowers' figures are demonstrable. No impairment of sphincters is seen. The mind is depressed in the patients under study as they are grown up and have realised their inferiority of muscular build.

ELECTROCARDIOGRAM



COURSE.—All muscles atrophy progressively with resulting lateral spinal curvature, talipes, etc. General health is unaffected and death is usually by pubertal age from weakness or pulmonary involvement.

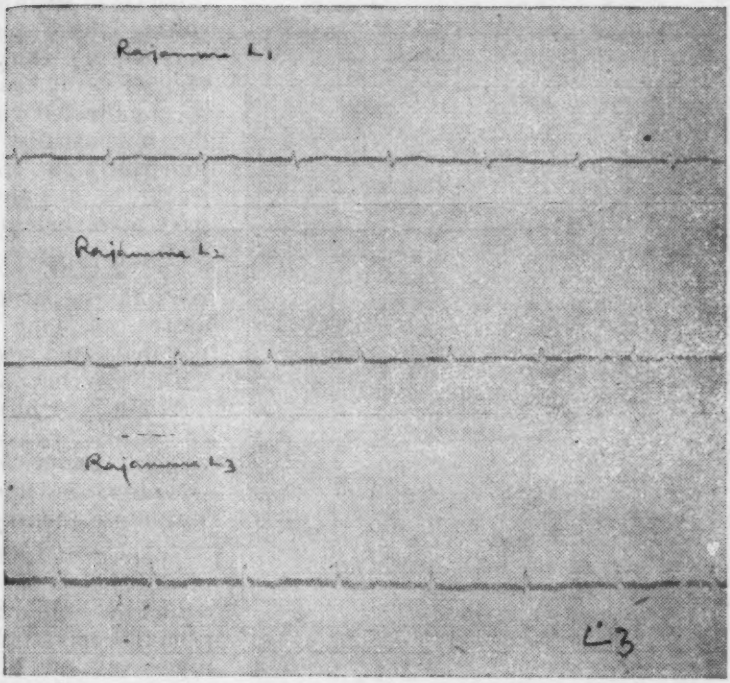
TREATMENT.—Keeping the patients active as long as possible and trial with Glycine and Vitamin E is advised. The female patient under observation is under Vitamin E therapy.

The writer has records below of two adults exhibiting pseudo-hypertrophic myopathy; one male and the other a female.

1. Vaidyalingam, male, 20 years old. Admitted on 2–3–'51 for pain in lower limbs of 2 years' duration. Clinically the patient is of thin build. Mentally depressed. Gait waddling and with lordosis. Calf muscles and infraspinatii are large. Abdomen: Liver and spleen not enlarged. Heart: nil particular. X-rays chest: A.P. view (picture) shows hilar shadows marked with basal streakings. X-rays spine (lower dorsal and lumbar): Nil particular. E. C. G. tracings: nil particular except for splitting of R in all leads. Blood Kahn test negative. Blood creatinine 1·1 mgm. %; Uric acid 4·4 mgm. %. Urine: nil particular.

2. Rajamma, female, 28 years, married, no children. Admitted on 4-3-'51 for inability to walk (duration not clear) for about some months. Clinically the patient is obese. Mentally anxious and depressed. Gait waddling and with lordosis. Calf muscles vey large. Gait waddling, and lordosis present. Heart : nil particular. B.P. 90/70 mm of Hg. Lungs : nil particular. Chest

ELECTROCARDIOGRAM



X-rays A-P view: Hilar shadows marked with excessive basal mottlings. Right cupola of diaphragm irregular. E.C.G. tracing : P is absent in all leads as also T in leads 1 and 2. R is split. T is negative in lead 3 (not significant). Blood Kahn test is negative. Blood creatinine 0·9 mgm%; Uric acid 2·7 mgm%. Urine: nil particular. B.M.R. + 10%.

Comment.—The two patients under study are adults, one of either sex. Radiological studies of the chest show dense hilar shadows and basal markings which may have a bearing in this condition as deaths are frequently from pulmonary infections.

Electrocardiographic tracings of one patient (Rajamma) have shown absence of P in all leads and T in leads 1 and 2. R is split. Do these indicate myocardial damage or intoxication ?

The pseudohypertrophic myopathy is classically and clinically a manifestation of skeletal muscles (striped). Is it possible that the myocardium (striped syncytium) also shares a silent fibro-fatty change leading to enfeebled heart and consequential death ?

Summary.—Pseudo-hypertrophic myopathy is recorded in an adult female. A possible damage of the lungs and heart muscle, which may be silent, is also suggested as part of the pathology in this condition.

The writer is indebted to Dr. P. R. Kalyanasundaram, M.B., B.S., Superintendent, Government Royapettah Hospital, Madras, for all the encouragement received ; and The Director, Government X-Ray Department, General Hospital, Madras, for the co-operation on the electrocardiographic side.

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CHLOROMYCETIN IN CHOLERA

J. KRISHNA, L.I.M.,
Dharmavaram, (Anantapur Dt.).

NEXT to small-pox, cholera comes in its dreadfulness and the observer will be annoyed with horror at the very sight of the patient. Every year this epidemic is taking away many lives due to lack of proper medical aid and specific medicines. Except the usual drugs the effect of which is much doubtful and the salines the purpose of which is for a quite different function, there is no seasonal drug mentioned to arrest the disease. Specific Ayurvedic medicines had given better results than what are told in the lines of the other systems. This epidemic has taken an annual roll in our town and has become a nuisance. For such a troubling disease as cholera anybody would wish to possess a drug of quicker action just like that of the above drug in cases of typhoid. So this prompted me to use the same one in this type of gastro-enteritis just to try its effect. Another thing is its use is quite harmless though it might prove ineffective. In the same season during last year I could use this drug in one case only and to my amazement I saw a dramatic improvement in diarrhœa and vomiting, the two main dreadful symptoms after the fourth dose was given in nine hours within which time six capsules were consumed. The drug was continued in reduced doses till the patient recovered.

I had an idea to try this drug in some more cases and find out whether it is worth using in cholera but as the epidemic was brought round there was no chance for me then. Neither I could assess its value with this single result. Nothing is told of its action on cholera in man. It was found to be effective in the treatment of experimental cholera in mice. Anyhow this single experience gave me full

satisfaction that this drug could be tried in this dreadful disease with some good result.

Just during last month our town became the victim of this epidemic once again. Nearly about sixty cases were recorded out of which nineteen or twenty died. The virulence of the disease was so severe that death occurred within twenty-four hours in most of the cases that died. Nearly thirty persons were treated in the isolation shed. Thanks to the sincere work of Dr. R. N. Sharma and that of Dr. Shrimathi Sharma who attended on those cases day and night without rest, all have been reported as completely recovered. Out of these sixty cases only seven cases were treated with Chloromycetin as all the patients were very poor to purchase this costly drug. For two cases this drug was given freely by a philanthrophic gentleman and by the local Service Guild.

All the cases were very bad to look at. In six of the cases the drug was used in very serious stages of collapse. Three cases were treated with this drug in their houses. Five cases were treated with this in the isolation shed when the usual treatments were found to be of no effect. My observations depended on the symptomatic improvement as laboratory facilities were not availabe at this place. The following are the cases :

CASE I.—Sixteen years boy, duration of the attack—fourteen hours. Suppression of urine had set in three hours after the onset of the attack. The boy was in a serious algid stage, with profuse purgings and vomitings. No medicine was given till then.

After giving him first a little quantity of brandy with soda water one capsule was administered. An hour after this another capsule was given. Between the two he had three motions and one vomiting. After the second dose he had only one motion and was complaining of vomiting sensation but never vomited. Thence onwards three hours once one capsule was given. Totally he was given six capsules only. In between, small quantities of brandy with soda water and glucose were being given. After the third dose he picked up warmth and pulse was felt at the wrist. He passed small quantity of highly coloured urine. Twelve hours after the first dose he had a motion of greenish mucus-mixed stools. He recovered completely.

CASE II.—A male of forty years, with a duration of eight hours. He had number of purgings and vomitings which continued with the same severity and complained of abdominal pain and discomfort. He was not medically attended on till then. There was suppression of urine and he was very cold.

First dose of two capsules was given following some quantity of brandy with fresh lime-juice cordial. Within two hours he had three motions and three vomitings. At the second hour he was given another two capsules. After this he had three or four times vomitings and purgings. Then there was complete cessation of both

the symptoms. He was advised to continue the drug at the rate of two capsules three hourly. After the fourth dose he had slight rise in temperature. The drug was continued upto twelve capsules. The duration of fever was only of a few hours. He easily recovered.

CASE III.—A female, aged eighteen, complained that she had dozen times purgings and six or seven times vomitings within four hours. She was very cold and profusely sweating and the pulse was very thready. There was suppression of urine also.

After the first dose of two capsules she had three or four times loose motions and once vomiting of small quantities of fluid. Thence both the symptoms disappeared. The drug was continued one capsule three hourly upto eight capsules. She recovered very easily.

The above three cases were treated in their houses as the isolation shed was not got ready by that time. In the first two cases there was much dehydration but no saline was given. Within two or three doses of this drug a good turn in the condition of the patient was noticed. I was much influenced by the results of this drug and wanted to try in some more cases to have some more evidence. Along with this only alkaline mixtures were administered.

In the isolation shed nearly thirty cases were admitted and in five cases this was tried with very good results. Here the treatment consisted of Sulphaguanidine and salines to alleviate the symptoms of dehydration. With this treatment an average recovery from the disease was noticed after four or five days. There was gradual reduction of the symptoms day by day. Many of the patients placed on this treatment were exhibiting the continued state of collapse for very long periods inspite of prompt attention and good number of saline injections of maximum doses. Salines were given twice or thrice daily and in some cases it was continued for three to four days. The recovery was very slow. With this treatment in one or two patients complete cessation of choleraic diarrhœa and vomiting was effected after seven days. In many of the cases good lot of cardiac tonics were given along with the salines to keep up the heart. Fortunately all the cases treated in this shed recovered. In one case the heart was affected and he too recovered from the complication after two weeks. The following five cases were treated with Chloromycetin :

CASE IV.—A girl of eight years with a duration of the attack —20 hours. She was vomiting and purging every ten minutes. State of collapse was setting in by the time she was brought to the shed. Immediately she was given saline subcutaneously and was placed on Sulfaguanidine. After six hours she was once more given saline intravenously to combat the impending collapse. Still vomiting and diarrhœa continued without rest. The patient was groaning for relief.

After eight hours' treatment with Sulfa drug, but with no improvement in the condition, she was changed to Chloromycetin. After the first dose of one capsule she had vomitings and purgings only twice. One more capsule was given after an hour and since then both vomiting and diarrhœa stopped completely. Really it was a dramatic result. She passed urine after an hour. She was found to be lively after some time. The drug was continued upto eight capsules. After twenty-four hours she passed solid coloured stools.

CASE V.—Female of forty years with a duration of the attack 15 hours. The patient was continuously in algid state. She was much sunken. For about 10 hours she was placed on Sulfaguanidine and she was given thrice full doses of intravenous saline combined with Coramine. The condition was found to be worsening. Then Chloromycetin was started with one capsule an hour for three doses. After the third dose there was much reduction in the quantities of fluids passed out. The frequency was also bettered. From the fourth dose one capsule every two hours was given. After the fifth dose there was marked improvement in the condition and there was complete cessation of vomiting but she had two or three motions, and then afterwards even that also was absent. Six hours afterwards she passed semi-solid coloured stools and also good quantity of urine. This result was affected by only six capsules. The drug was stopped as it was not available. But she began to recover slowly and never showed any recurrence which I was afraid of. This is a case where we had no hopes.

CASE VI.—A girl of sixteen, four or five hours after the onset of the attack was admitted into the shed and for about eight hours she was placed on the usual treatment and full doses of saline was given twice within that time. There was no improvement in her condition. Then she was placed on Chloromycetin in the same way as the above patient. With six capsules cholera type of motions stopped. Then onwards the dose was changed to one capsule every three hours. After this change she had three or four loose coloured motions. After twelve hours it was noticed that there was complete relief from every symptom of the disease. She easily recovered afterwards.

CASE VII.—A male of forty years. Within the first half an hour he had two motions and two vomitings. He had temperature also. He complained that he had a kind of abdominal discomfort and headache during the previous night. Within an hour he had four or five times purgings and vomitings and the last one was of typical choleraic type. The temperature was 102°F. For about six hours he was given heavy doses of Sulfaguanidine with no marked effect. Afterwards Chloromycetin was given one capsule every two hours for the first two doses. After the second dose the frequency of vomiting and diarrhœa was found much improved. The dose was continued three hours once. General condition of the patient

was much improved. After the fourth dose temperature was found to be normal. Totally six capsules were given.

CASE VIII.—A female of twenty years. On the seventh day after delivery she had nearly thirty purgings from morning till evening but she had no vomiting at all. She was much sunken and the pulse was not felt at the wrist. She had all the symptoms of severe dehydration. The wonder here is that she had not even felt the vomiting sensation with all the other choleraic symptoms in very severe form. She was much restless due to cramps and also abdominal pain. She was immediately given a good quantity of saline and was placed on Sulfaguanidine.

After four hours she developed vomiting also besides purgings which were continuing with the same severity. The symptoms of collapse were found imminent. When the party was asked to purchase Chloromycetin for her use they dodged to get it due to its heavy cost and were also confident on the patient's recovery which they had seen in all the cases treated in the isolation shed. For about five days she suffered from this teasing disease, of course with gradual reduction in purgings and vomitings day by day. For three days she was given saline and glucose both morning and evening to combat the collapse, and Sulfaguanidine was the only drug used. On the fifth day she passed coloured stools of semi-solid consistency. But on that night she had sudden rise of temperature and it shot up to 104°F. It was suspected to be puerperal sepsis. Heavy doses of Penicillin for four days could not bring down the fever. All these four days she had not even a single motion but there was no other complication except high temperature.

On the fifth day of the fever the doctor gave her it seems Chloromycetin as is given in cases of enteric fevers. By the eighth capsule, within sixteen hours or so, the temperature came down and the drug was continued upto twelve capsules. There was no further rise and she recovered from all the complaints.

POINTS OF INTEREST:—(1) The virulence of the disease during this epidemic was so severe that death occurred within twenty fours of the attack in most of the cases that died.

(2) The dramatic recovery noticed in one case during the last epidemic in 1950 prompted me to use this drug which gave me good hope.

(3) Nearly twenty cases died out of sixty attacks which were mostly untreated. The other cases that survived without any treatment took at least a week for complete recovery and were showing gradual improvement of the symptoms throughout.

(4) All the cases admitted into the isolation shed treated with prompt care and attention with salines and usual routine treatment recovered but all the cases took three to four days for improvement and recovery.

(5) In cases treated with this wonderful drug the two main dreadful symptoms disappeared mostly within twelve hours after it was administered and there was very quick recovery in general health also due to short period of suffering.

(6) In a case of puerperium the post-choleraic febrile reaction which was unaffected by large doses of Penicillin and Sulfa drugs disappeared very easily immediately on its use.

(7) The help of laboratory facilities could have given a correct estimate of the usefulness of the drug in this disease besides the symptomatic improvements observed.

(8) Anyhow the dramatic improvement and the quick recovery it had worked out in all the cases show that this is a worth trying drug in cholera with confidence though nothing is told about its action on vibrio in man.

I am told by the Department of Medical Service, Parke, Davis & Co. that Prof. R. N. Choudhury and his colleagues of the School of Tropical Medicine, Calcutta, have tried Chloromycetin in ten cases during the last epidemic in Bengal and have published their findings in the *Indian Medical Gazette*, September, 1950. Their conclusions, it seems, point out the fact that if dehydration incident is controlled earlier, Chloromycetin may prove useful to reduce the mortality rate from this infectious disease. In addition, they recommend that this may be useful prophylactically to reduce mortality rate for which treatment is to be started as soon as the case is suspected so that the patient does not reach the stage of dehydration. Experimental work recently described by Gauld and others indicate that Chloromycetin is an effective agent in the treatment of experimental cholera in mice. Complete inhibition of growth is assured with levels as low as 5 micrograms of Chloromycetin per c.c. of culture medium.

We could not very closely observe the cases and record in detail our observations. Anyhow as for my observations I feel this is worth trying as a curative measure in this infectious disease.

Myocardial Infarction and Rest

Irvin and Burgess state that the physician rigidly restricted the fluid intake of œdematous persons, with no voice but the patient's raised in protest. Surgical and obstetric patients were likewise kept at prolonged post-operative or post-partum bed rest until critical thought and perhaps the shortage of beds stimulated the re-examination of the evidence. There is no statistical evidence that bed rest or even markedly restricted activity over a prolonged period advantageously affects either the course or the later sequelæ of myocardial infarction. No controlled series of cases has been reported ; yet bed rest has long been *sine qua non* in the treatment of myocardial infarction.—*(New. Eng. Jl. Med.*, 243, 486, 1950).

A CASE OF PYELITIS DUE TO BACT. COLI INFECTION TREATED UNSUCCESSFULLY WITH CHLORAMPHENICOL

SUKHENDU DAS GUPTA, M.B.,
Assistant Surgeon, Assam Railway, Pandu.

ABOUT four months back, I had to attend a case on the 9th day of her fever.

Patient, a female widow, aged 55 years, weighing 60 lbs., emaciated. She has her only son aged 35 years. She gave a history of fever which started insidiously 9 days back and the fever from third day was ranging between 101°F and 103°F. She was clinically anæmic. Heart and lungs--Nothing abnormal could be detected. She had mucoid stool. Urine examination revealed—Sp. gravity—1020. Albumin +, Pus cells + +, motile organisms, blood examination revealed W.B.C. 12,500, Poly—80%, Lympho—19%, Mono—1%, Stool—Ent. Histolytica cyst occasional, pus cells +.

With the idea that the case might be one of enteric fever, complicated with Bact. coli pyelitis, the attending physician started Chloramphenicol on the 6th day of fever, 4 capsules of 250 mg. each initially followed by 2 capsules every 4 hours. After 36 capsules the temperature came down to 99°F which lasted for about 12 hours, and rose again to 120°F although Chloramphenicol was being continued. However, 5 phials of 12 capsules were administered but the temperature continued. At this state blood examination revealed the following :—

Total W.B.C. 11250, Poly—82%, Lympho—16%, Mono—2%. The urine showed Sp. gravity 1025, albumen + +, pus cells +, Motile organism +. The urine was sent for culture.

Chloramphenicol was stopped and Sulphamezathine I.C.I. two tablets every 6 hours started alternately with mist. alkaline and other usual precautions for Sulpha drugs. Cardiac stimulant like Coramine by mouth and Glucose I.V. was given. After 50 tablets, the temperature came down to 100°F. to rise again to 103°F. when Sulphamezathine was stopped. The culture report of the urine was available by this time, which showed Bact. coli.

As Sulphamezathine was not effective, it was discarded and Dihydrostreptomycin was started $^1/_2$ g.m. B.D. intramuscularly. On the 3rd day and onward the number of pus cells in each field of the centrifuged sediment gradually became scanty and the patient completely afebrile after 9 gm. of Dihydrostreptomycin. Glucose I.V. and Coramine by mouth was continued all throughout this period.

POINTS OF THE CASE.—(1) Chloramphenicol was not effective for urinary infection due to Bact. coli. Bact. coli could be obtained on culture after sufficient dose of Chloramphenicol in this case.

(2) Sulphamezathine did not produce any result in this case, although given in sufficient dose. "Organisms obtained from urine of patients receiving Chloramphenicol treatment sometimes show profound morphological and cultural alterations" and may also be a factor for its being ineffective.

(3) Streptomycin proved to be efficacious for this patient of B. coli pyelitis resistant to Chloramphenicol and Sulphamezathine.

References:

1. Lancet—January 6. 1951, page 27. Bacterial Variants in Patients Treated with Chloramphenicol—By A. Voureka, M.D.
2. Practitioner—November, 1949, Sulphamezathine in Treatment of Urinary Infections.
3. P.D. & Co.—Literature on Chloromycetin.
4. Indian Medical Gazette—Chloromycetin, April, 1951.

Iron Encephalopathy

Birch and Till have recorded a case where severe cerebral symptoms occurred following the intravenous administration of iron. The problem of refractory microcytic hypochromic anæmia has been satisfactorily solved in many cases by the intravenous injection of an iron-sucrose complex, (*Lancet*, 1947, 2, 49). Nevertheless iron by intravenous injection and even by mouth is not entirely without risk. Iron poisoning has recently been brought to light, as ferrous sulphate by mouth has caused acute gastritis and death from hepatic failure. Cerebral symptoms following oral iron medication in man are however rare. Hurst (1931) reported the case of a very anæmic woman of 58 (Hb 18%) who took 40 grains of Ferri et ammon citras per day for 22 days and had nine convulsions in 24 hours on the 23rd day. Between attacks she was only semi-conscious and had twitchings of the face. Napier (1936) reported a case of encephalopathy in an Indian at Calcutta aged 30, who after taking 468 grains of Ferrous Sulphate in 26 days for a simple hypochlorhydric anæmia (Hb 18%) had a series of 7 fits in 24 hours. He also refers to a woman who had fits after taking 12 grains a day for 33 days. Mooney (*Br. Med. Jour.*, 1, 1951, p. 1267) mentions intense headache following an intravenous injection of 100 mg. of saccharated iron. Birch and Till now report the case of a woman aged 54 (Hb 41%) with iron deficiency anæmia, who developed severe cerebral symptoms after the intravenous administration of 380 mg. of iron in nine days. The authors however consider that the symptoms may be tentatively ascribed to iron encephalopathy and that the use of certain proprietary preparations of iron for intravenous use is valuable, safe and free from toxic effects, if they conform to a particular strength and if the dosage is kept below 100 mg. of iron per day. The danger of using unproved preparations is emphasized.—(*Br. Med. Jour.*, 13-1-1951, pp. 62–63).

DYSENTERY CAUSED BY ROUND WORM INFECTION

J. N. BHATTACHARJEE, D.T M., (Cal.),
A. M. O. and Pathologist, Gopalpur Tea Estate Hospital,
P. O. Gopalbagan, Jalpaiguri.

PATIENT named, Sanicharoa, a labour boy eight years old, was admitted in this hospital on 22-7-'51, with the following complaints :—

(1) Passage of blood and mucous in stool ; (2) anæmia ; and (3) œdema of foot and puffiness of face.

Previous history :—Patient was suffering from dysentery a month ago and was treated in out-door with Emetine and Mist. Oli. Ricini. Since then he used to pass blood and mucus in stool periodically.

Physical examination :—Patient was much debilitated. Oedema foot present up to ankle. There was puffiness of face. Anæmia present. Hb. value : 30%. Spleen enlarged 2 fingers below the costal margin. Frequency of stool about 10 or 12 times in 24 hrs. No tenesmus present but he complained of vague abdominal pain. Slight rise of temperature at evening ranging from 98·4°F. to 99°F.

Laboratory report on stool :—Consistency :—No fæcal matter ; contains flecks of mucus and blood in moderate quantity. Reaction : neutral. Ova hook-worm : +. Ova ascaris lumbricoids :- +++. Ova trichuris trichuria :++. C.L. crystals : +. No protozoa present. Cellular elements less.

TREATMENT.—The patient was given liquid light diet the previous evening.

23-7-'51.—(1) Santonin gr. i ; Phenolphthalein gr. i ; Sodi Bicarb gr. v ; Pulv. one at H.S. ; (2) S.S. Magsulph 1 oz. at c.m.

On the next morning he passed about 25 round-worms in the morning stool and began to pass 3 or 4 worms in every stool for the next 2 days, *i.e.*, altogether he passed about 50 round-worms. After the 3rd day of above treatment, surprisingly I noticed that blood altogether stopped in stool and the frequency was also less.

Considering the secondary infection he was put on Sulphaguanidine 6 tablets daily for 5 days.

After a week of the above treatment, the patient was much better and a second course of Santonin was given. At this time only 5 round-worms were passed.

Treatment for anæmia was given and after a month of treatment patient was treated for hookworm infection with Tetrachlorethylene.

Patient was discharged cured on 28-8-'51.

POINTS OF INTEREST :—(1) Passage of blood and mucus in stool with no improvement by Emetine given in out-door.

(2) Laboratory report on stool does not give any suspicion of bacillary type of infection.

(3) Remarkable results were obtained by Anthelmintic treatment.

I am grateful to Dr. N. G. Mazumder, M.B., B.S., G.M.O. of this Estate for his valuable suggestions and kind permission to publish this case note.

Epididymitis in Mumps, Including Orchitis

S. Candel (*Annals of Internal Medicine*, 34:20, Jan. 1951) reports a study of 66 cases of mumps orchitis, in 12 of which the orchitis was bilateral. Of the 78 involved gonads, 67, or 85 per cent, showed inflammation and enlargement of the epididymis; in 18 cases the swelling was slight; in 44, the size of the epididymis was two to four times the normal, and in 5 cases six to twelve times the normal. Often it is not difficult to determine the involvement of the epididymis, but if the gonad is much swollen, it may be difficult to outline the testis and the epididymis separately; this can be done by daily palpation as the inflammation begins to subside. In the author's study of the 66 cases, he obtained the impression that the swelling of the testis began to subside before the swelling of the epididymis. The chief symptoms of epididymo-orchitis in these cases of mumps were tenderness, pain and swelling or induration; pain and swelling disappeared fairly promptly after the temperature became normal, but tenderness persisted, in several cases, many days longer than the other symptoms. On discharge from the hospital, enlargement and thickening of the epididymis, without pain, was present in 19 cases. The most prominent sign of involvement of the gonad at the time of discharge was the loss of turgor of the testicle, which was noted in 35 tests, or 44·9 per cent of the gonads involved; evidence of atrophy of the testis was found in only 4 cases at this time. If atrophy of the testes occurs after mumps epididymo-orchitis it is evident that it is a progressive process, continuing after the patient is free from symptoms and is discharged from medical care. The fact that epididymitis occurred in so large a percentage of the cases of mumps orchitis in the author's series is of importance, as it is frequently overlooked and its real importance is not recognized. In the treatment of mumps, the injection of gamma globulin from convalescent serum has been found to reduce the incidence of epididymo-orchitis, but when the gonad has become involved, the treatment is entirely symptomatic—including rest in bed, elevation of the testis, use of an ice bag, and salicylates and codeine sulfate to relieve pain. Sterility probably does not often result from mumps orchitis; in cases in which sterility does occur, more attention should be paid to the epididymis as the possible "offending factor."—*Medical Times*.

CRANIOPHAGUS BABY WITH 4 TEETH

T. M. VENKATACHALAM PILLAI, L.I.M.,
Private Medical Practitioner, Thuraiyur, Trichy Dt.

ON 26th July in the early morning I was called to attend a delivery case in a village 3 miles away from my place. I went there with all my equipments.

It was a case of impacted breech and by Fillet's traction the child was delivered and there was no difficulty in the after-coming head. The child was alive for 12 hours and died at 6 p.m. on the same day. To my surprise there was a circular growth hanging from the

occiput 6 inches in diameter and 2 inches in thickness. There was a small tear in that membrane and blood was coming out. Inside there was only a very soft tissue just like brain matter. It had four big teeth, 2 upper and two lower. I took a photo of the baby as I was much interested.

Then I wrote to Sir A. L. Mudaliar, M.D., L.LD., D.C.L., Vice-Chancellor, Madras, with a photo requesting him to enlighten me in the above case. He wrote to me that this is like double monster, what we call craniophagus. The sac that we see attached to the head is that of another fœtus which is not developed and which is in a rudimentary stage.

Acknowledgement.—I have great pleasure in expressing my indebtedness to Sir A. L. Mudaliar, M.D., L.L.D., D.C.L., Vice-Chancelor, Madras, for having enlightened me in the above case.

SYMPATHETIC OPHTHALMIA

K. S. GHASWALA, L.M.S.,
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A. B., a Hindu male, aged about 30, was brought to me by his master with the following history:

History:—He is a servant in his master's farm at Kalyan near Bombay. About 20 days ago whilst working in the field he was accidentally struck in the right eye by the horn of one of his bullocks. There was no blood in the eye at the time of the injury, but his lids were very much swollen, so much so that he could not open the eye. He fomented the eye and put some household medicine in it. About three days after the injury, when the swelling of the lids had subsided a little, he noticed that he could not see fingers in front of his eye. He waited till the swelling of the lid completely subsided and he could open the eye when he was brought to Bombay as he could not see.

State on admission:—The anterior chamber is very deep, there is a coloboma of the iris upwards, and at the upper part of the bulbar conjunctiva about three millimeters on the upper and outer side of the limbus there appears a cystoid swelling under which the lens is dislocated (subconjunctival dislocation of the lens). The tension of the eye is minus.

Both the subconjunctival dislocation of the lens and the minus tension suggest that the injury is of a perforating nature.

Ophthalmoscopic examination:—Shows that the vitreous is full of blood and no details of the fundus can be made out beyond a very faint fundal glow.

Vision:—R.E. = No. P. L.; L. E. = 6/6.

The fundus and all the media of the left eye are perfectly normal. There is neither lacrimation nor vascular injection nor photophobia nor pain in the left eye.

TREATMENT.—The patient was advised and persuaded to have the right eye enucleated as there was no vision in it and as otherwise there was every chance of his losing the left eye also by sympathetic ophthalmia.

Though I did not tell the patient, his relatives as also his master were informed that as already 20 days had elapsed since the injury, the left eye may be affected even after enucleation.

The patient refused to stay in Bombay to have his eye removed and even to take Cyanide injection. He was, therefore, given Guttae Atropine Sulph. 1%, Mercury injections and Mist. Sodii Salicylas (grs. xx to ℥i) t. d. s.

After a fortnight the patient came to me again complaining of redness and pain in the left eye. He had also marked lacrimation and photophobia.

On examination :—The R. E. was the same as before. The L. E. had vision reduced to 6/60. There was slight ciliary injection and the dark room examination showed the vitreous and other media hazy and the fundus could not be seen clearly but as if through a fog. There were no K. P. to be seen. Evidently "Sympathetic Irritation" had set in the left eye.

TREATMENT.—The patient now agreed, though unfortunately too late, to have the right eye enucleated ; but the next day though much persuaded he refused enucleation and wished to be treated by medicines only. After a great deal of persuasion he agreed to take Hg. Cyanide injection which was given and he was put on the following treatment : (*a*) Guttæ Atropine 1%, thrice daily in both eyes ; (*b*) Mist Sodii Salicylas (grs. xx to ʒi) t. d. s. and (*c*) inunctions of Mercury. This treatment was continued for five days but the eye was getting worse day by day and a very thorough examination on the next day showed very fine K.P. on the cornea of the left eye. The mediæ were very hazy and the vision was reduced to counting fingers at about 12 ft.

The patient after persuasion now consented to have his right eye removed which was done on the following day. Of course the patient and his relatives were told that it was too late, especially as sympathetic ophthalmia had already commenced in the left eye. On the following day he was given a second subconjunctival injection of Hg. Cyanide (viii minims of 1 in 2000) combined with the other treatment as before *viz.*, Atropine, Salicylates, Atophan tablets 7½ grains t.d.s. were tried. As the patient was finding no relief he left after a week, since when I have not heard of him. His vision on discharge was about 10 ft.

I believe *this case brings out the following facts regarding sympathetic ophthalmia very clearly* :

(1) That sympathetic ophthalmia follows a perforating injury to the exciting eye. Purulent uveitis or panophthalmitis in one eye never causes sympathetic in the other.

(2) An interval of at least 14 days is required between the injury in one eye and the onset of sympathetic in the other. Generally between the 6th and 8th week is considered to be the most dangerous. In the above case the sympathetic trouble commenced about the sixth week.

(3) That in every case of perforating injury—more so when there are no chances of saving any vision in the injured eye—the eye must *at once* be enucleated to save the other eye.

Though in the above case I cannot say whether enucleation of the injured right eye would have stopped the onset of sympathetic in the other, as already about 20 days had elapsed after the injury when the patient was first seen, yet as there was no vision in that eye advising enucleation was justifiable. Of course in such cases our prognosis must be very guarded.

(4) The best time to enucleate the exciting eye is within 24 hours after the injury and even then we cannot say with certainty that the other eye is safe from sympathetic ophthalmia unless at least four weeks have passed after enucleation of the injured eye.

(5) The sympathetic ophthalmia in the above case commenced with what is known as "Sympathetic Irritation", the most common symptoms of which are lacrimation, vascular injection, photophobia and pain, all of which were present in the above case.

Though in this case the onset of sympathetic ophthalmia was preceded by all the signs of "Sympathetic Irritation" yet in many cases "Sympathetic Irritation" lasts a very long time without being followed by sympathetic ophthalmia.

(6) The much discussed question whether the exciting eye should be enucleated or not after a sympathetic has already commenced in the sympathising eye may be answered from the above case in which the exciting eye was enucleated after sympathetic had already commenced, because there was not the slightest hope or chance of retaining useful vision in the exciting eye. Hence we would be justified in enucleating the exciting eye only if there is no chance of retaining useful vision in that eye and not otherwise.

Thrush in Infants

The general belief that oral thrush is a benign disease of infants which scarcely merits attention is a dangerous illusion. Thrush is caused by the fungus *Monilia albicans*, which is saprophytic to man except in conditions specially favourable to it. Such conditions occur in the mouth of the young infant and the vagina of pregnant women, for both possess acid secretions with an unusually high pH close to the optimal for the organism. This is the main reason for the high incidence of oral thrush in early infancy and vaginal thrush in pregnancy. Repeated routine swabbing of the mouth in newborn infants showed that infection of the mouth with *Monilia albicans* in the neonatal period almost always causes thrush lesions within 2 to 8 days.

The characteristics greyish white adherent colonies and plaques of thrush of the mouth, are most frequently seen on the tongue but usually affects several parts of the buccal cavity. As a rule the lesion covers only a small part of the mucosa at the height of the disease. There are no symptoms and the infection gradually subsides. But such a benign course should never be assumed, for the disease may progress and cause fatal lesions in the alimentary tract or elsewhere. There is thus a potential danger in every case of thrush, particularly in premature and debilitated infants. The application of gentian violet 1% in aqueous solution twice daily in the early stages of oral thrush usually checks the spread of lesions and causes their disappearance in a week.—(Summary of leading article *Br. Med. Jour.*, 23-12-1950).

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A CENTRAL MEDICAL COUNCIL WANTED

WITH the slow and steady growth of medical personnel in this country and the accelerated growth that is expected in the near future as a result of the prospective establishment of more and more medical colleges to secure the personnel needed to meet the ever-growing needs of the people, the medical profession is coming to its own and it has become absolutely necessary to regulate its growth and the practice of the profession by the members on a proper and sound basis so that India can stand on a par with other advanced countries in the West. We have in India the Medical Council of India, and in many States there are Medical Councils, some of them statutory and the rest non-statutory. While responsibilities might have devolved on non-statutory Medical Councils in some of the States, the lack of statutory authority disables them from discharging their duties satisfactorily. The position cannot be left in this fluid state any longer and something has to be done, and that too without delay, to enable them to discharge their duties and responsibilities satisfactorily.

Presiding over the meeting of the Medical Council of India held last month in New Delhi, Dr. C. S. PATEL, President of the Council, pointed out that only the formation of a Central Medical Council with a number of zonal offices in the States would help solve the peculiar medical and health problems of the country. It is accepted on all hands that India lacks the required medical personnel to meet her requirements. And the Governments in the country will have, sooner or later, sooner than later, to give up the snail's pace at which they are progressing and establish a large number of Medical Colleges to prepare the personnel necessary to equip

the present ill-equipped institutions and to man the large number of institutions that have to be established to meet the growing needs of the people. It is a matter for satisfaction that the caste system which had till a short while ago disfigured the profession and created schism among the ranks has been given up and medical schools have been abolished. But the ever-growing and pressing needs of the country appear, unfortunately, to have caused a set-back to the progressive thoughts of some State Ministers and diverted them from the royal road to short cuts, *i.e.* providing additional medical personnel through shorter courses. This, in effect, would only mean the revival of the caste system which it took many years of hard struggle for the medical profession to get abolished. And this, inspite of the repeated statements by the Hon'ble the Minister for Public Health with the Government of India that there can be in the country only one medical qualification and that is the M.B., B.S., Degree. True it is that the course is too long, arduous and costly that serious attention has, of late, been given to the question of the reduction of the course by the elimination of some subjects, or by the reduction in the period allotted to them. Even at this meeting of the Medical Council this subject was discussed, we are told, at considerable length, on the recommendation of the Executive Committee, but it was decided to circulate it to the Universities for their opinion in the matter. The course followed by the Medical Council is the correct one since the recommendations of the Executive Committee of the Council in this and other matters have caused some surprise in some quarters on the ground that they are beyond the scope of the Council. Be that as it may, and whatever be the final decision taken by the Council on other matters, there can be no gainsaying the fact that "Free India", in the words of Dr. PATEL, "needs an adequate number of properly qualified and specialised persons in the different branches of medicine and we should be content with nothing short of the highest available standards elsewhere in the world. We cannot afford to continue to entrust human life to the hands of half-baked or unqualified persons." "This objective", he says "can be achieved only by the formation of a single central body like the Medical Council of India on the lines of the General Medical Council of Great Britain."

We are aware that strong protests were voiced forth recently at a conference of licentiates held in the Punjab that the Medical Council has not justified its existence and that it is more a fifth wheel in the coach than a body interested in the advancement of the profession and that its achievements are next to nothing. One has to take into consideration the restrictions under which it has to labour. True it is that it was modelled at that time on the lines of the General Medical Council of Great Britain but it was not placed in a position analogous to that of the General Medical Council. Place it on a sound and satisfactory basis, bestow it with

powers needed to achieve the objects in view. It is bound to become an useful and efficient organisation not only for the purpose of taking legal proceedings against unqualified practitioners for unprofessional conduct but also help advance the cause of medical education and medical standards in this country.

This raises the question of the status to be assigned to the practitioners of the indigenous systems of medicine in the future set-up. Some people are swayed by national sentiment and are anxious to place these systems on a par with the allopathic system of medicine. Having played a large and noteworthy part in times of yore and still having a large number of votaries, no one would say that these systems should be relegated to the past and not given any recognition or encouragement. But even the protagonists of these systems candidly admit that they have remained static for long and require to be placed on a sound footing by making advancements therein through research and otherwise. It is one thing to say that these systems should be given the encouragement they need, but it is another thing to say that even people professing to have only a smacking knowledge of these systems should be let loose on the society to fill up the gap between the need and the actual availability of medical practitioners. We very much regret that the consideration of the recommendations of the sub-committee on indigenous and homœopathic medicines has been postponed to the next meeting. These have become burning topics on which the opinion of the Medical Council should be made known early with a view to enable the Governments, both in the Centre and in the States, to so shape their future policy that the best interests of the country and of its people can be well and truly served.

The suggestion of Dr. PATEL for the establishment of a Central Medical Council with a number of zonal offices is an important contribution to the solution of the problem facing the profession. What the constitution of the Council should be, what powers should be entrusted to it and what relationship should exist between the Council and the Government, are all matters of detail which can be worked out after due consideration. The basic question whether there should be established in India a Council of the kind envisaged by Dr. PATEL should be given due consideration by the members of the profession in their organisation and their views on the subject made known to the public, the Council and the Governments.

EXPANSION OF MEDICAL AID

MEDICAL aid is so very limited that so many preventable deaths occur in this country. It is not therefore out of place to harp on it at every available opportunity with a view to draw the attention of the Governments to the urgent need of taking a long step forward. Particularly, infectious diseases such as

tuberculosis, malaria and the like always lie in wait in every corner, awaiting the opportunity to lay their strangle hold on healthy but innocent people. We have been repeatedly urging on the attention of the Governments the immediate and urgent necessity of improving public health and extending medical relief on a large scale, to ensure positive health to the people with a view to enable them to take their legitimate share in the implementation of plans intended to take the country forward in its industrial and economic spheres. But as we have pointed out on a previous occasion the Planning Commission has not given as much attention and importance to it as it deserves. The wealth of the nation is dependent on the health of the people and therefore health programmes have to be given top priority even to enable the Governments to go ahead with their plans.

Replying to Mr. R. SURYANARAYANA RAO the other day in the Madras Legislative Council whether the Government have formulated any plan for the extension of the facilities for the diagnosis and treatment of tuberculosis, eye diseases, ear, nose and throat diseases, venereal diseases and leprosy, the Hon'ble KALA VENKATA RAO, the new Minister for Public Health and Medical Relief, stated that these diseases are treated in all hospitals in the State to the extent treatment can be given in such hospitals. Under the post-war scheme of expansion of medical relief it is intended to make provision for a first class laboratory, X-ray department, special departments for tuberculosis, venereal diseases, leprosy and eye diseases and to have specialists in each of these departments..... Proposals have been called for from the Director of Medical Services, for improvements to venereal diseases clinics in *some* of the District Headquarter Hospitals and for the establishment of a Central Reference Laboratory for venereal diseases at the King Institute, Guindy. for being brought forward as a Part II programme for 1952–'53. Special clinics for the above diseases are opened wherever necessary." It would have been interesting and instructive if the Hon'ble Minister had furnished details as to the number of clinics that have been opened for the treatment of these diseases with a view to appraise them at their true worth. That apart, the statement of the Hon'ble Minister makes it clear that the establishment of these additional facilities will be only in the Metropolitan hospitals and some of the head-quarter hospitals. Diseases of this kind have the special knack of laying their hold on people without differences of area, caste, creed etc. In that respect they scrupulously follow the fundamental rights guaranteed in the Constitution that there shall be no distinction of caste, creed, sex etc. And it is a well-known fact that the majority of the people are poor that they cannot afford to bear the expenses involved in transporting themselves to places where these facilities are proposed to be made available. Only when these facilities are placed within the easy

reach of people in every nook and corner of the country, can the Government lay claim to have discharged their elementary responsibility to the people. Maybe it will not be possible for the Governments in our country, conditions being what they are at the moment, to launch on ambitious and all-pervading schemes as those launched by the Government in Great Britain. But they are bound to make suitable provisions for the improvement of public health and the expansion of medical relief, whatever their financial position. No superstructure raised without proper foundation can stand the stress and strain of every day life. The present governments in India are at the fag end of their career and nothing substantial can be expected to be done within the remaining short period of their office. It is up to the people to demand of the candidates who are seeking their support in the forthcoming elections an assurance that top priority will be insisted upon, if they are elected, to the problems of public health and medical relief. In this way they can help themselves. Self help is the best help.

Reactions to Glucose (Dextrose)

Febrile reactions following intravenous injections of solutions, were formerly put down to the bacteria existing in river water and tap water. It is not the bacteria *per se* but their toxic products. Elimination of pyrogens, (which were considered responsible for febrile actions) is achieved in several ways. Some authors consider that the rapidity of the infusion is responsible for some of the shock symptoms.

Randolph *et al*, (*Arch. Surgery*, 61, 554, 1950) are of the view that there remains a residue of reactions even after complete elimination of all pyrogens and regulation of speed of administration. The fact that only a few patients have reactions, while most do not suggest that an individual idiosyncrasy or allergy plays a part. These authors stress that sensitivity to corn occurs as often as sensitivity to wheat, if not more so. They demonstrated that crystalline sugars prepared from corn starch may cause intense allergic reactions when ingested by sensitive people. The rapidity of the onset and the severity of the reactions clearly indicate in such cases that the sugar is allergenic in the form administered. Patients who are sensitive to corn or corn sucrose, are often found to tolerate alpha-d-glucose from beet sucrose; conversely glucose prepared from beet sucrose will produce allergic reactions when ingested by patients known to be sensitive to beets.

The authors reproduced in 5 patients who showed great sensitivity to ingestion of corn and corn products, similar allergic phenomenon by intravenous injection of a 5 per cent dextrose solution. *It, therefore, appears probable that some of the stormy post-operative courses may be explained on the basis of allergy to dextrose*—(Editorial in *J.A.M.A.*, 144, 16, 1379, 1950).

SURGERY

Pros and cons of tonsillectomy.—(*B.M.J.*, 20-1-1951).

In the above article, Dr. A. H. Gale of the Bristol University discusses the pros and cons of tonsillectomy, in which considerable differences exist. The problem has recently become more complicated than ever, because of the increased prevalence of poliomyelitis. The statistical evidence relevant to the general indications and contra-indications for operation is critically examined by Gale. Kaiser's survey of 4400 children in U.S.A. schools, half of whom had the operation and the other half had not, is the most comprehensive of all and he lays down the following points as definite indications for operation: (1) Interference with normal breathing, and snoring; (2) difficulty in swallowing; (3) nasal or altered voice; (4) persistent nasal discharge; (5) otitis media and impaired hearing; (6) repeated attacks of tonsillitis or quinsy; (7) enlarged cervical glands; (8) chronic sinus troubles; (9) rheumatic fever; (10) pyelitis; nephritis; (11) retarded mental development; and (12) impaired nutrition and anorexia. Gale, however, is not in total agreement with these suggestions as some of them are not borne out by incontrovertible evidence.

The "Report on Epidemics in the Schools of England" relating to children over 13 years of age concludes with these observations: "One cannot avoid the conclusion that there is a tendency nowadays for the operations to be performed as a routine prophylactic *ritual* for no particular reason and with no particular result." In a more recent follow-up of 337 children operated on at the Radcliffe Infirmary at Oxford in 1947-1948, no special advantage or benefit had been derived by the operated children, except perhaps a *slightly reduced* liability to sore throats and colds.

At the discussion held at the Royal Society of Medicine in London (*Proc. Royal Soc. Med.*, 1950, 43, 317). The following important recommendations were recorded:

(1) Tonsils should very rarely be removed before the age of 5. Adenoids should however be removed at any age and that only if they cause severe nasal or eustachian obstruction. Causes other than adenoids causing nasal obstruction should first be eliminated.

(2) Tonsillectomy should not be performed on a child who has never had symptoms, whatever may be the appearance of the tonsils as this varies enormously in the same child and at different times.

(3) Tonsils may be removed only when frequent attacks of tonsillitis with fever occur and true tonsillitis should be carefully differentiated from transient sore throat. The number of attacks in a year is not so significant as the consideration of the degree of general disturbance—temperature, duration etc.

(4) Tonsils should be removed after a suitable interval after quinsy.

(5) Tonsils should be removed in the very rare instances where they are so enlarged as to cause mechanical obstruction.

(6) Tonsils should be removed in chronic diphtheria carriers when other treatments have failed.

Recently some amount of justifiable anxiety has been felt because of the suspected association of poliomyelitis (of the bulbar type specially) with tonsil operations. In a nationwide survey of polio cases treated in hospitals in England in 1949, 16 cases of poliomyelitis were reported to have followed within a month of operation for tonsillectomy.

It is, therefore, considered better to delay the decision to operate, than to hurry it and above all to avoid operation on tonsils which have recently been inflamed.

Fallacies in acute appendicitis.—A study of acute appendicitis was begun at New Orleans Charity Hospital in 1933, and 7,613 cases were analyzed in seven series. The total mortality rate was 4·46%, but it has declined successively from 6·58 to 1·7%. Despite this decline, the incidence of complications is increasing. This may be partly explained by the fact that many patients entered the hospital after the first 24 hr. of illness and that more than a third had taken purgatives, sometimes on the advice of physicians. Enemas were also ordered by physicians, and icebags are again being used. Apparently, many physicians are not aware that appendicitis is often an atypical disease. The physician should not wait 12 hr. to "re-evaluate" a patient; operation should be performed at the end of six hours if acute appendicitis cannot be ruled out. That the mortality rate has declined despite the aforementioned deplorable tendencies is largely due to intensive supportive therapy and to chemotherapy. The limitation of chemotherapy is stressed: many delays in surgical treatment must be attributed to its unjudicious use. The author favors prompt operation, because: (1) The diagnosis of rupture of the appendix is inaccurate. (2) It is impossible to determine whether peritonitis is spreading or is localizing. (3) A localized abscess may rupture intraperitoneally and cause death. 4. A properly performed surgical procedure that removes the source of infection is safer than continued entrance into the peritoneal cavity of infection from a ruptured viscus. (5) The results of conservative therapy are no better than the results of prompt surgery. While the curative properties of the antibiotics should be utilized, it should be remembered that they are ineffective in areas of inadequate circulation, such as in gangrenous processes and walled-off abscesses. In uncomplicated cases of acute appendicitis these agents are adjuncts to, not substitutes for surgical procedures.—*Journal of American Medical Association.*

A simple method for the management of scalp wounds—I. Phillips Frohman, M.D. (From "*Medical Annals of the District of Columbia*", Dec., 1949).

For the past eight years, because of a large experience with scalp wounds, I have developed a form of treatment which has proven of value. This plan encompasses the following features: (1) simplicity, (2) avoidance of special technical training and equipment, and (3) minimum of discomfort and apprehension to the patient. Approximately 365 wounds have resulted in primary healing without serious infection.

Anatomy.—The first and third layers of the scalp, namely, the skin and epicranius muscle, are firmly united by fibrous processes which pass from the skin through the second or subcutaneous fatty layer to the epicranius. This intimate association of layers usually produces a "clean type" of wound in scalp lacerations. This is distinctly different from wounds seen in the abdomen or the extremities, wherein there is retraction of the muscle from the fascia, the fascia from the fatty layer, and the fatty layer from the skin.

The blood vessel arrangement of the scalp is likewise strikingly different from that of any other part of the body. The vessels are supported in a loose cellular layer which lies between the scalp proper and the pericranium. Further, the vessels lie immediately within the tough inelastic layer of subcutaneous tissue. The latter is made up of strong, short, fibrous septa which contain small granular fat lobules. This anatomic relationship of blood vessels explains their unyielding character when an incision or laceration occurs in the scalp. Two main stem arteries which anastomose freely over the median plain are responsible for the blood supply of the entire area. They are respectively the internal carotid for the frontal area and the external carotid for the remainder of the scalp. Since the blood supply of the skin is continuous with the underlying tissues, injuries of the superficial tissues in the scalp may survive even though a considerable portion of the scalp is detached from the cranium. Hæmorrhages superficial to the epicranius muscle are usually limited to this area because of the density in the subcutaneous layer, whereas hæmorrhages

beneath the epicranius muscle are rarely extensive because of the presence of small vessels. Further, extravasations of blood beneath the pericranium lead to hæmatomas that are limited entirely by the skull sutures.

Material studied:—Wounds seen in this study were caused by the following materials: glass, slate, rough and smooth stones or bricks, sharp objects, and blunt weapons, such as blackjacks, sandbags, moving crane buckets, steel beams, falling timber, etc. These wounds in the vast majority of instances were of the "clean type". It has been my observation that the greater number of scalp wounds, except for the most trivial, are associated with division of the aponeurosis and separation of the epicranium. Extensive bleeding which appears with the immediate injury is usually self-limited, and profound hæmorrhage from scalp wounds is rare.

The period of study for this series extends from 1941 to 1948, and includes 365 scalp lacerations treated in my office. The wounds are classified into the following types: (1) superficial, or those which include the skin and fatty layers, (2) deep, in which all 3 layers are involved, and (3) complete, in which actual avulsion of the scalp occurs. Breakdown of the wounds in this respect reveals that 334 were superficial, 23 were deep, and 8 were complete; the length of wounds varied between 2·5 and 15 centimetres; 289 occurred in males and 76 in females; 212 were children and 153 were adults.

Treatment:—The method of treatment includes the following plan: The wound and scalp are thoroughly washed with either sterile normal saline or zephiran solution, since repeated washings are necessary for the removal of all loose debris and blood. No attempt is made to shave the scalp or remove the hair adjacent to the linear edges of the wound. After adequate washings, the wound is carefully evaluated. If the aponeurosis is split or torn, an X-ray film of the skull is made. It is a good procedure to make X-ray films of all scalp wounds. All devitalized tissue is debrided. Local anæsthesia is not instituted.

If the wound is of the "superficial" type, no deep sutures are applied, but the wound is dusted with sterile sulphathiazole crystals and the skin edges are approximated with Michel clips $^3/_8$ of an inch apart. The advantage of clips over sutures is the simplicity of application and the prevention of inversion of the skin edges. This accomplishes a side-to-side approximation of the superficial parts of the skin.

If a deep wound is present, a minimal number of 00 chromic sutures are placed in the fascia and muscles. Again, sulphathiazole crystals are applied and the skin edges approximated in the usual manner with Michel clips. Drains are used in scalp wounds. The skin clips are applied $^3/_8$ of an inch apart.

In the event of the complete type or avulsion of the scalp, following the washing and debriding the muscles and fascia are closed with 00 chromic catgut, the wound dusted with sulphathiazole crystals, and the clips applied to the skin. Penicillin is not employed locally or as part of the definite aftercare of scalp wounds. In this entire series severe wound sepsis has not been seen. Another innovation in treatment which is probably different from the usual recognized methods is that dressings are not applied. The hair is simply pulled over the clipped area. A routine practice in the definitive care of these patients is the use of tetanus antitoxin alone, or tetanus antitoxin and gas bacillus vaccine. The vaccine used depends on the circumstances surrounding the injury. After this care the patient is instructed to return to the office within 24 hours. With the superficial type of wound, a firm blood crust is usually seen at this time. The patient is carefully instructed not to comb his hair. After 48 hours the wound is observed again. If primary healing has taken place, the skin clips are removed and the patient is warned to avoid trauma for another 5 to 7 days. A final examination is then made. In extensive wounds the scalp cilps are left in place for 72 hours. If a hematoma develops, the wound is aspirated under sterile precautions with an 18-gauge needle.—*General Practitioner*.

Pseudocysts of the pancreas.—Pancreatic cysts have been divided into (1) pseudocysts (traumatic, inflammatory); (2) retention cysts; (3) neoplastic cysts (cystadenomas, cystadenocarcinomas, sarcomatous, teratomatous); (4) congenital cysts; (5) parasitic cysts; (6) miscellaneous pancreatic cysts, cystic hemangio-endotheliomas, cavernous hemangiomas and epidermoid cysts.

This report is concerned with the 44 cases of pseudocyst of the pancreas in which surgical treatment was performed at the Mayo Clinic during the years 1935 to 1947 inclusive. A pseudocyst of the pancreas is a collection of material of a more or less fluid consistency usually adjacent to but occasionally within the pancreas which may result from inflammation or trauma. Such a cyst is surrounded by a sac which does not have a lining epithelium, in contrast to a true retention type of cyst. Pseudocysts are one of the most common types of cystic lesions of the pancreas. Pancreatitis appears to be the most frequent etiologic factor in the development of a pseudocyst. Characteristically, a patient who has a cyst of this type presents a history suggestive of recurring pancreatitis and a rounded mass somewhere in the upper part of the abdomen. The mass may change in size or at times disappear entirely between attacks of abdominal pain. Occasionally pain is absent or minimal. Rœntgenologic studies may show abnormalities in the stomach or duodenum caused by pressure from the cyst.

There has been considerable controversy regarding the surgical treatment of pseudocysts of the pancreas. In the 44 cases here reviewed incision and drainage was done in 19 cases; incision and marsupialization in 12; complete excision in 5; excision of cyst and partial pancreatectomy in 3; partial removal of cyst in 1; no surgical treatment of cyst in 4 cases. The authors say that some authors regard complete excision as the best treatment, but at the Mayo Clinic it has been observed that pseudocyst of the pancreas, unless unusually small, does not lend itself well to total excision as it does not have the wall of a true cyst, is adherent to all surrounding structures and may require quite an extensive and hazardous operation for its total extirpation. It seems certain that if complete removal were attempted in all cases, the operative mortality would be excessive. Seldom if ever does it appear justified to perform partial resection of the pancreas in order to remove a pseudocyst, especially if the cyst is located in the head of the gland. Internal drainage by anastomosis of the cyst to the stomach, gallbladder or jejunum has been reported. In most cases and for most surgeons external drainage of adequate duration, preferably by marsupialization if the cyst is large, appears to be the treatment of choice. Although recurrence may take place if drainage is maintained for too short a time, this can be prevented in almost every case by careful postoperative care. The chance of serious infection developing in the cyst and adjacent structures during drainage is minimal with irrigation of the cyst and the antibiotics which are available today. Probably the main objection to this type of treatment is the prolonged care necessary while the cystic cavity is gradually being obliterated. Serious excoriation and digestion of the skin surrounding the site of drainage do not occur after drainage of a pseudocyst even though the material which drains is composed solely of pancreatic juice since the latter is inactive before it enters the duodenum. Attempted obliteration of a pseudocyst by injection of a sclerosive or necrotizing agent is not recommended.

Incision and drainage with or without marsupialization was found most advantageous at the Mayo Clinic. Cysts recurred in only three of the 31 cases in which treatment of this type was employed. In each of these three cases it appeared that an inadequate period of drainage had been maintained.

(Brilhart, K. B. and Priestley, J. T., *American Journal of Surgery*, 81:151-160 (Feb.) 1951. The authors are connected with the Mayo Clinic, Rochester, Minnesota).—*Surgical Newsletter, U.S.I.S.*

Traumatic shock.—Hugh C. Ilgenfritz, M.D., (from "*New Orleans Medical and Surgical Journal*," Sept., 1949).

Peripheral circulatory collapse is the commonest cause of death in patients who have suffered severe traumatic injury. Many individuals who have sustained fractures, lacerations, internal injuries, or even damage to the tissues of the central nervous system following violent trauma may recover without incident; others whose injuries appear to be comparatively minor may succumb to shock within a few hours.

Although many widely different aetiologic factors may cause shock, the physiologic basis for the condition and the mechanism of its production still are not entirely clear. The clinical picture, however, is only too well known to every physician.

Clinical picture:—The patient in shock is characteristically in a state of general collapse; although fully conscious, he may be scarcely able to speak or move. The skin is pallid, cold, and damp, occasionally exhibiting tiny droplets of perspiration. The pulse, at first relatively normal in character, soon becomes weak and thready, often with little acceleration in rate until the later stages of shock. Respirations are shallow, the expenditure of efforts by the muscles of respiration being little more than barely sufficient to keep the patient alive. Occasionally a patient in the earlier stages of shock may be restless and excited; frequently also nausea and vomiting may appear. As the condition progresses, however, the excitement gives way to dullness, apathy, and decreased sensitivity, until even the perception of pain may be lost. The blood pressure always falls, often to such a low level that it can scarcely be determined, and the temperature is typically subnormal.

Crushing injuries, especially with fractures of long bones and widespread devitalization of muscle tissue, are most likely to produce shock, which appears an hour or more after injury. Frequently, however, secondary influences such as loss of blood, chilling, insufficient fluid intake, severe pain, fear, or anxiety, may aggravate the efforts of a comparatively minor injury and may produce shock unexpectedly many hours after the accident or may increase the severity of a state of shock already developing.

Physiological characteristics:—While shock can be produced by many different types of injuries such as trauma, burns, or hæmorrhage, the physiologic characteristics are much the same. As a result of local injury to the blood vessels following a traumatic accident, plasma and blood are lost into or from the tissues of the traumatized area. This withdrawal of fluid from the blood stream reduces the circulating blood volume, and the cardiac output and velocity of blood flow decrease correspondingly. Reflex peripheral vasoconstriction suffices to maintain the blood pressure above shock level for a short time, but as the vascular fluid loss continues or the compensatory vasoconstriction begins to fail, the blood pressure drops to shock level and tissue anoxia results, with asphyxia and depression of function of the heart, liver, kidneys, lungs, and brain. Hæmoconcentration develops as the loss of plasma continues, the erythrocyte count and hæmoglobin content of the blood rising in proportion to the withdrawal of plasma. At this stage, the capillaries throughout the body become anoxic and dilated, impounding large quantities of sluggishly moving blood. The increased viscosity of the blood interferes still further with its passage through the capillaries, and the venous return to the heart decreases concomitantly. If the vicious cycle of shock is allowed to persist untreated for too long a time, the tissue asphyxia produces irreversible damage to the vital structures, and therapeutic measures then are of little value.

Traumatic or surgical shock does not appear instantly after the injury has been sustained, but appears an hour or more later, since it depends upon a significant loss of blood or plasma. The collapse which follows immediately after a relatively minor injury is often called primary shock, but is actually a transient hypotension due to reflex vasodilatation on a neurogenic basis. Collapse of this type is similar to the sudden drop in blood pressure which may occur during spinal anæsthesia or may follow a severe emotional reaction. Here there is a sudden fall in blood

pressure as a result of the impounding of a large amount of blood throughout the dilated peripheral vascular bed, but there is no loss of fluid from the blood stream, nor is there any change in the blood volume or the total cell mass. This reaction is temporary and recovery is usually prompt.

Oliguria or anuria may follow traumatic or surgical shock, probably as a result of decreased blood flow in the renal vessels. As a rule, kidney function returns to normal after shock has been controlled by blood transfusion. In some cases, however, especially in the presence of extensive crushing injury, a characteristic renal lesion occurs, with resultant anuria which may prove fatal. The suppression of renal secretion in the crush syndrome is accompanied by necrosis of the distal tubular epithelium in the kidney; this condition, similar to that occurring as a result of severe hæmolytic transfusion reaction, has been called "lower nephron nephrosis." While prophylatic measures probably are of little value in preventing development of the condition, it should be foreseen when severe crushing injuries are present. Treatment for shock is instituted as promptly as possible in such cases, and, as soon as the patient is in satisfactory condition for operation, all devitalized tissue is excised, fascial compartments are split if the underlying muscle appears tense or swollen, and amputation is performed when indicated. It is a wise precaution to chart the daily fluid intake and urinary output in every patient who has suffered a severe traumatic injury, but it is especially advisable when crushing injuries are present.

TREATMENT.—Before surgical treatment of a moderately severe traumatic injury is begun, the possible presence of a pre-shock state should be considered. Even though tissue damage has been relatively severe and a significant amount of vascular fluid loss has occurred, the blood pressure may be maintained within a relatively normal range for a short time by reflex peripheral vasoconstriction. A patient thus may be on the verge of collapse and yet may be able to talk or even sit up. If repair of injuries is attempted before treatment of impending shock is begun, the pre-shock state may progress suddenly to profound collapse. Premonitory signs of threatened shock include anxiety, agitation, restlessness, pallor, cold clammy skin, rapid soft pulse, and a moderate drop in blood pressure. The reduction in blood volume cannot always be demonstrated early in the course of the post-traumatic state by means of blood counts and hæmatocrit determinations. Even though enough blood or plasma has been lost following injury to produce a state of shock, the erythrocyte count and the hæmatocrit value may still be within the normal range for a variable length of time after the accident.

The best treatment of shock is prevention. Many patients who could survive their injuries die of the associated shock. The treatment of fractures, lacerations, head injuries, and even of thoracic and abdominal trauma can wait with safety for one or more hours if necessary until the blood volume has been restored by transfusion, the blood pressure has risen to a safe level, and the patient is no longer in danger of shock. The only two surgical emergencies which offer a greater threat to life than secondary shock are continuing hæmorrhage and obstruction of the respiratory tract. Either of these conditions must be relieved instantly; this having been done, the treatment of actual or impending shock takes precedence over the care of any other surgical condition.

The injured patient is disturbed as little as possible; measures are taken to prevent further injury and to reduce discomfort. Fractures are splinted, wounds are covered with sterile dressings, and morphine is administered if needed. Definitive treatment of injuries is postponed until after shock or impending shock has been brought under control. Blankets are used to conserve body heat; hot water bottles or heating pads are not used, to avoid increase of blood flow in the skin and consequent withdrawal of blood from the vital centres. Morphine is given for pain, but never when undiagnosed visceral damage may be present. Stimulant drugs are used only to help maintain the blood pressure at a relatively safe level until transfusions or infusions can be secured. Such

drugs are of much value in neurogenic hypotension, when injury has been slight, but are potentially dangerous when the fall in blood pressure is accompanied by significant reduction of the total blood volume.

Restoration of the depleted blood volume is best accomplished by transfusion of whole blood; enough is administered to raise the systolic blood pressure at least to a level above 100 millimetres of mercury. The quantity of blood which may be required varies according to the extent of trauma, the length of time that has elapsed since the injury, the condition of the patient before the accident was sustained, and the amount of blood or plasma which has been lost. In some cases, a state of impending shock can be treated successfully with a single transfusion of 500 cc. of whole blood; in other cases, 40 per cent or more of the total blood volume may have been lost, and from 1,500 to 2,500 c.c. of blood may be required for full replacement.

If blood is not immediately available, plasma is the best substitute; it is given rapidly and in sufficient quantity to raise the blood pressure safely above shock level. No attempt is made to restore the blood volume entirely to normal by transfusion of plasma alone, since the red cell deficit also must be corrected by subsequent administration of whole blood.

If plasma is not available, normal salt solution, with or without dextrose, is given slowly by infusion until compatible blood can be obtained. While less satisfactory than plasma as a substitute for blood, crystalloid solutions are of life-saving value in supporting the depleted blood volume for a short time.

Other blood substitutes, such as solutions of concentrated human serum albumin and of purified gelatin, appear to be of much value, but are not generally available; still others, such as pectin and bovine serum albumin, are efficacious but are unsafe for general use because of their toxic properties.—*General Practitioner.*

Tonsillectomy and poliomyelitis.—Opinions vary as to whether tonsillectomy should be performed during the summer and autumn which comprise the endemic period of poliomyelitis. Dunn (1950) points out that in choosing the time for tonsillectomy the dangers of respiratory infections during winter should be weighed against those of poliomyelitis in the summer.

The average incubation period of poliomyelitis is 12·2 days (Dowe, 1950). If the virus is present in the pharynx when tonsillectomy is performed the operation may precipitate the disease within 7-21 days. The contacts of an infected patient frequently have the virus in the naso-pharyngeal washings, and it has been found in the stools of contacts for two months after exposure. From a study of fatal cases it has been demonstrated that the virus often reaches the nervous system from the pharnyx.

During an epidemic, subjects of recent tonsillectomy are slightly more liable than those not operated upon to contract the disease, and the proportion who develop the bulbar type is abnormally high. These observations support the view that tonsillectomy should not be performed during the summer months if cases of poliomyelitis are being notified in the neighbourhood.—Dowe, J. B. (1950). *Med. J. Aust.*, 2, 241. Dunn, R. E. (1950). *Med. J. Aust.*, 2, 243.—*Medical World.*

Malignant tumours of bone.—*(Ann. Surgery,* Nov. 1950).

Bone sarcoma has one main difference from other malignant lesions in that it most often affects relatively young persons. Its highest incidence is among persons of 15 to 20 years of age. Plans for career detection must therefore include this age group particularly, if persons suffering from malignant tumours of bone are to benefit under any mass tumour detection programme. Mayo Clinic statistics recently compiled by Jackson and Meyerding show that in 75% of cases osteogenic sarcoma occurs about the knee. This localization to the lower end of the femur and the upper end of tibia and fibula in three fourths of all cases of osteogenic sarcoma is significant. Dr. Coventry considers that trauma occurring so frequently about

the knee is a definite inciting factor in the production of certain malignant bone tnmours.

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Misuse of antibiotics in the otitis media.—*M. Med. Ass. Jour.*, 41, 385, 1951).

Dr. M. N. Flanders, Otolaryngiologist of Maine, U.S.A., asserts that the disappearance of pain, fever and ear discharges in response to penicillin therapy during an attack of otitis media does not constitute a cure. The sterilization of exudate in the middle ear by penicillin therapy may prevent the complication of mastoiditis but complete resolution of the inflammatory changes that have taken place in the middle ear can be effected only by the escape of the fluid from the middle ear. A properly performed myringotomy done in the early stages of the acute otitis media accomplishes this. When myringotomy is not done the continuous presence of an exudate in the middle ear, even though it might be sterile, causes thickening of the membrane of the middle ear. The mobility of the ossicles and even of the ear-drum are greatly lessened. Ultimately some fibrosis develops beneath the membranes and the hearing acuity suffers a permanent reduction. The histological changes that occur are irreversible.

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Changes in the scoliotic spine after fusion.—(*Jour. Bone and Joint Surgery*, Oct. 1950).

Ponseti and Friedman investigated 117 cases of scoliosis which were treated by spinal fusion, and found that the growth of the fused segment of the spine in young patients was either absent or only minimal except when pseudo-arthrosis occurred. Pseudo-arthrosis was common in the most mobile segments of the spine. When the entire lumbar section has been fused it was always present; after fusion of the thoracic section alone, it was not so commonly seen. Spontaneous closure of the pseudo-arthrosis was often observed when the scoliosis became stabilized. In idiopathic thoracic, and thoraco-lumbar curve patterns short fusions of the main curve and one vertebra above and below it gave the most satisfactory results. Increase of the scoliosis following the spine fusion was seen when the fused area was either too long or too short. In extensive fusions, increased scoliosis was associated with pseudo-arthrosis bending of the graft, or the addition of more vertebræ to the curve. When fusion did not reach the ends of the curve, increase occurred above or below the fused segment. The authors found that the long-range findings on surgical fusion for scoliosis have been disappointing in many cases.

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Acute cholecystitis—(*Surg. Gynaecol. and Obst.*, Sep., 1950).

Ross and his colleagues review the results of their experience at Peter Bent Brigham Hospital with cases of acute cholecystitis. The resolution of the inflammatory process after an acute attack is exceedingly slow and incomplete irrespective of the clinical course of the patient's condition. After a short period devoted to the restoration of the fluid balance and the starting of antibiotic therapy, there is nothing to gain by delaying surgical treatment if the patient is doing well. The inflammatory process persists for months and sometimes for years after the clinical symptoms have subsided. The time spent in hospital is usually prolonged and the technical difficulties of surgery also increased.

On the other hand, if the patient is doing badly surgery is obviously mandatory and it is in such cases that simple cholecystectomy under local anæsthesia may be a life-saving procedure. Ross *et al* consider that *the concept should be abandoned* that there is any arbitrary cubical period during which surgery for acute cholecystitis is to be avoided.

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Blind intestinal pouches resulting from lateral anastomosis.—(*Surgery*, May, 1951).

Heifetz and Senturia describe eight cases of blind intestinal pouches following lateral anastomosis. In five of these eight cases the symptoms were undoubtedly considered to be due to the blind pouch. In the other three, other lesions were present which might also account

for the symptoms. The symptoms fell into the general categories of perforation with peritonitis, intestinal obstruction, nutritional disturbances and anæmia. Heiferz and Senturia consider that careful roentgenological studies should be carried out on all patients of lateral anastomoses who suffer from symptoms such as abdominal pain, distension, nausea, vomiting, diarrhœa, and nutritional disturbances. The need for surgery depends on the nature of the symptoms and technical considerations. The substitution of end to end anastomosis for the lateral type prevents the formation of blind pouches.

OBSTETRICS AND GYNÆCOLOGY

Posterior colpotomy: An aid in the diagnosis and treatment of ectopic pregnancy.—The observations reported in this paper were based upon the experience of the Obstetrical and Gynecological Staff of the Presbyterian Hospital in the diagnosis and treatment of 224 ectopic pregnancies during the years from January, 1920 to July, 1949.

The history is a greater aid in the diagnosis of a suspected ectopic pregnancy than are physical and laboratory findings. Any patient in the child-bearing age who gives a history of temporary amenorrhœa, disturbed bleeding, lower abdominal soreness, crampy or sharp pain, pain referred to the shoulder, or pain not infrequently related to the emptying of the bladder or bowel, and who may have had faintness or shock of varying degrees must be suspected of having an ectopic pregnancy. Disturbed bleeding and any combination of these symptoms should suggest ectopic pregnancy.

While in a small group of patients a fairly definite diagnosis of ectopic pregnancy can be made from the history, physical examination and laboratory findings, in most instances the suspicion of the presence of an ectopic pregnancy must be confirmed by surgical inspection of the site of pregnancy.

Draa and Baum stress the value and safety of the posterior colpotomy incision. The patient with a diagnosis of a suspected ectopic pregnancy was prepared for surgery. Under general anæsthesia the cervix was dilated and the uterus curetted to rule out a disturbed intrauterine pregnancy. If insufficient scrapings were obtained to make a diagnosis, the posterior cul-de-sac was opened. Upon the opening of the cul-de-sac, the presence of fresh or old blood was noted. Then the tubes, ovaries, and uterus were inspected for the presence of disease. Inspection was facilitated by the use of the Heaney narrow-blade vaginal retractors and by grasping the posterior wall of the uterus with tenacula or uterine hooks so that the uterus could be manipulated to bring the adnexa into view. If the ectopic pregnancy was an early one, it was usually not only exposed without difficulty but was also removed without difficulty. Occasionally, fibrinous adhesions would hold an early ectopic pregnancy against neighbouring structures. Not infrequently, these adhesions could be freed by gentle finger dissection, thereby securing mobility so that the ectopic pregnancy could be brought down to the incision and be removed.

The diagnosis was established for 149 of the 224 cases of ectopic pregnancy by the use of the posterior colpotomy incision. In 77, or 34·37 per cent of the 224 cases reported, the extrauterine pregnancy was diagnosed and removed through the posterior colpotomy incision.

Ectopic pregnancies were removed by laparotomy 72 times after the suspicion of extrauterine pregnancy was positively confirmed by visualization through the posterior colpotomy incision. The ectopic pregnancies in this group were of longer duration. The posterior colpotomy incision will give a positive diagnosis and prevent delay in treatment of extrauterine pregnancy and will also prevent unnecessary laparotomies. When a laparotomy is necessary to remove an ectopic pregnancy visualized through the colpotomy incision, there is no increased risk to the patient.

Although the posterior colpotomy incision is a simple, safe procedure for the diagnosis of ectopic pregnancy and, frequently, the incision allows ample space for removal of the pregnancy, it has been used by few surgeons and has even been condemned because of the danger of introducing infection into the peritoneal cavity. This has not been the experience of these authors.

(Draa, C. C. and Baum, H. C., *American Journal of Obstetrics and Gynecology*, 61 : 300-311 (Feb.), 1951. The authors are connected with the Departments of Obstetrics and Gynæcology, Presbyterian Hospital of the City of Chicago and University of Illinois College of Medicine, Chicago, Illinois). —*Surgical Newsletter, U.S.I.S.*

The cause of breech presentation.—(*Am. Jour. Obst. and Gynaecol.*, July, 1950).

Dr. Charles S. Stevenson who has made an elaborate study of the subject, has shown that the placental position in the 'term' or 'near-term' uterus could be determined accurately in 98% cases. He carried out an investigation into the influence of placental implantation on breech presentation..seventy six gravid women who had persistent breech presentation at term or near term were thus studied. It was observed that the *in-situ* placenta was implanted over one lateral fundal and tubal area of the uterine wall in all cases. Since the head of the fœtus is smaller than the breech and legs, the head will tend to accommodate itself to the smaller pole of the amniotic sac ovoid, whilst the breech will tend to occupy the larger lower uterine segments of the sac. Thus, cornual implantation of the placenta as it indents and alters the shape of the amniotic sac, is considered by Stevenson to be the principal cause of breech presentation of the human fœtus. The implantation site was verified at delivery or cæsarean section in about 18% of cases by intra-uterine palpation of the *still-in-situ* placenta. Primiparity and right axial torsion of the uterus *also* play a major role in maintaining the persistence of breech presentation until term. *Stevenson enunciates he following new obstetric principle* :—"The position of the implanted placenta in the near-term or full term human uterus as it indents and alters the ovoid shape of the amniotic sac determines the polarity of the sac independently of the fixed polarity of the containing uterus; functionally the fœtus accommodates itself to the shape of the sac, the fœtal head seeking the smaller pole; and thus the placental implantation site has a determining effect upon the presentation of the fœtus."

Penicillin vaginal suppositories.—(*Am. J. Obst. Gynaecol.*, 60, 806, 1950). Turner of St. Louis Hospital for women, reports on the effect of penicillin vaginal suppositories on morbidity in vaginal hysterectomy and on vaginal flora. A theobroma oil suppository containing 100,000 units of crystalline potassium penicillin G was inserted vaginally from 12 to 14 hours prior to operation in 100 consecutive non-selected vaginal hysterectomies. Only 7 of these 100 patients experienced post-operative febrile morbidity. By using identical pre-operative preparation *but excluding* the use of the penicillin vaginal suppository, 21 out of 56 vaginal hysterectomies developed fever after operation in one series and 73 out of 210 cases in another series of similar cases. Bacteriologic and clinical studies supported the author's belief that penicillin vaginal suppositories are of value in reducing morbidity when employed as an adjunct in pre-operative preparation for vaginal hysterectomy.

Anovulatory menstruation.—(*Am. J. Obst. Gynaecol.*, 60, pp. 790–796, Oct. 1950).

Wong *et al* obtained from 36 sterility patients of child bearing age, 47 endometrial biopsy specimens, which all proved to be anovulatory. 28 of the patients were nulliparous. The duration of sterility was from one to 9 years. 13 of the 36 patients had a normal menstrual history while the other 22 gave histories of oligomenorrhœa or secondary amenorrhœa. Only one of these had menorrhagia. The number of anovulatory cycles in the 36 patients varied from one to five. Nineteen patients were

anovulatory continuously while under observation for several months to a year whereas the other 17 were periodically so. Four of these 17 subsequently became pregnant. The overall clinical picture of these 36 patients showed a fairly *constant correlation between obesity, mild hirsutism, and anovulation.*

MEDICINE AND THERAPEUTICS

Suppurative thrombophlebitis treated with aureomycin.—(*Br. Med. Jour.*, 13, Jan. 1951, pp. 72–73).

Of the various types of thrombophlebitis, the infections and suppurative cases form only 3 per cent. They are often fatal owing to development of pyæmia and metastatic foci. Jackson of the Birmingham Accident Hospital, records a case of ilio femoral thrombophlebitis in which the prognosis was grave and became worse by the infecting staphylo-aureus turning penicillin-resistant, the chemotherapy was discontinued too early and ultimately a successful recovery was nevertheless obtained with aureomycin, *without* vein ligation proximal to the thrombus.

The suppurative ilio-femoral thrombophlebitis arose from a transfusion incision infected with penicillin-resistant *staphylococcus aureus*: The patient was a child aged 3 years who fell into a bath of hot water and received scalds on his back, thighs, and left arm. The extent of the scalded area was 24 per cent of the body surface and 2% being whole skin loss. On the sixth day after admission the child's Hb. was 69% and a blood transfusion was made after cutting down on the right great saphenous vein at the ankle. Four days later his temperature rose to 105° F. and the pulse to 160. Systemic penicillin was given 6 hourly; sulphadimidine was also given orally. On the 13th day a small abscess was incised over the upper end of the tibia and the pus gave a pure growth of a penicillin-resistant *staph. aureus*. On the 21st day an operation was performed and the saphenous vein and its tributaries were collapsed and empty but the femoral vein was thrombosed. It was opened. After taking material for a culture the femoral vein was tied but the thrombus was palpable at least ½ inch proximal to the ligature. Aureomycin was given but stopped early; so there were two recurrences, but after 125 mg. had been given 6 hourly for 28 days (total 14,000 mg.) the condition was finally cured.

Mild hypothyroidism: A common disease.—Christman says that of the many patients who consult physicians complaining *of fatigue* a relatively small number have cardio-renal disease, anæmia, diabetes, tuberculosis, or Addison's disease as a basis for this complaint. In many instances life situations are a little too difficult. Sometimes the fatigue can be accounted for by poor habits of living, or a schedule of activities which leaves no leisure.

The author stresses that many of these people who are tired show some signs of symptoms of hypothyroidism, and laboratory data and response to desiccated thyroid confirm this diagnosis in many instances. He reviews observations on 138 patients who had symptoms of hypothyroidism and who were found among 1,000 consecutive unselected case histories of patients seen in the surgery during a period of a little less than four years. The most frequent clinical signs of hypothyroidism in these patients were: a lowered basal metabolic rate, an elevated serum cholesterol and response to thyroid therapy.

It is important to differentiate hypometabolism from hypothyroidism, because hypometabolism is not benefited by desiccated thyroid and a low basal metabolic rate may occur in healthy persons as well as in Addison's disease Simmond's disease, starvation, nephrosis, sometimes in diabetes; it is also found at times in undernourished persons. The determination of the serum cholesterol content may help to distinguish this group when the differential diagnosis is not obvious; a therapeutic trial with thyroid is also helpful in

differentiation. In the series of 1,000 patients 20 were found who had a low basal metabolic rate but did not have hypothyroidism.

The 138 patients with hypothyroidism included 79 parous, and 33 nulliparous, women and 26 men. The author believes that child-bearing and menstruation might both be factors contributing to the higher incidence of hypothyroidism in females.

Fatigue was a symptom in all of the patients with hyperthyroidism and 41 per cent of all patients complaining of fatigue were found to have hypothyroidism.

Dry skin and hair, brittle nails, poor cold tolerance, dyspnoea, œdema, hypotension, early atherosclerosis, constipation, vaginal discharge, sterility, miscarriage, dysmenorrhoea, menstrual irregularities, impotence, headache, muscle and joint pains, and stiffness, and macrocytic or hypochromic anæmia were less common. Blood cholesterol was consistently elevated.—Christman H. E. Lakeswood, (1950). *Ohio State Medical Journal*, 46, 965-970.—*Medical World.*

Hormones of digestive tract.—(*Nature*, Vol. 166, pp. 714–715, 1950).

Popular interest in the control of digestive functions has centred on the Russian physiologist Pavlov's demonstration of the reflexes, both conditioned and unconditioned, which play a very important part in the regulation of the salivary and gastric secretions. The discovery of '*secretin*' by Prof. Brocklehurst was an eventful one as it was the very first clear demonstration of the liberation of a chemical substance from an organ of the body into the blood stream and its specific action on another organ. From this discovery, in fact, sprang much of the work on hormones of all kinds. Prof. Brocklehurst surveyed at a recent meeting of the British Physiologists at Birmingham, the great volume of research work during the last 50 years, which has established the existence of the hormones:—'*Gastrin*' which stimulates acid secretion by the stomach, '*secretin*'—the corresponding stimulant of the pancreas and "*cholecystokinin*" which brings about contraction of the gall-bladder. There is evidence, too, that gastric activity, both secretory and motor, may be inhibited by the release of a hormone—"*enterogastrone*" from the small intestine. Secretin and gastrin have no stimulant action on the output of enzymes in the gastric and pancreatic juices. Recent work has been concerned with the action of these substances in the human subject and with the mode of their release during normal digestion. Three substances—secretin, pancreozymin and cholecystokinin have so far been prepared in a form sufficiently pure for intravenous injections in man. It has been claimed that the examination of the duodenal contents after secretin is of value in the diagnosis of malignant or chronic inflammatory lesions of the pancreas.

There has been increasing interest in recent years in the mechanism of the release of the digestive hormones. In an interesting discussion of the activities of the intestinal mucosa Dr. R. B. Fisher stressed the very high metabolic rate of the mucosa, which in animal experiments, was found to be completely replaced every 36 hours. He considers that the mucosa builds up peptides from absorbed digestion products of protein and it is known that the hormones are also peptide in nature. The presence of peptones in the gut leads to a building up of proteins in the mucosa and the application of injurious agents such as acid to the mucosa leads to the breakdown of cystoplasmic protein. These substances are known to bring about a release of the hormones from the intestine and so the hormones may be normal products of the breakdown of the mucosal cystoplasm.

Time action of globin insulin.—(*Arch. Int. Med.*, 86, 2, 178–188, 1950).

For fully ten years, it has become increasingly apparent that the sustained weak action of the oldest of the depot insulins (protamine zinc insulin) is too slow and uncertain for the best control of severe forms of diabetes mellitus. The advantage of prolonged effect is also its chief fault, because its action after a morning injection has been so weak that patients with severe diabetes excrete large amounts of sugar after

even an ordinary meal. If dose is increased, insulin shock often results. In milder forms it has been very satisfactory because details of insulin timing then are unimportant. A third type of insulin, therefore, has been developed for use in *severe diabetes*. It is the "Intermediate" insulin as its effects are about midway on the average, in speed, intensity and duration. Intermediate insulin preparations have now come into widespread use in severe diabetes because of their greater efficiency and convenience. Three specific preparations with intermediate action have been studied and used extensively in U.S.A. Colwell and his co-workers of the Wesley Memorial Hospital in Chicago, report on a comparative study they made and give the results obtained by them after confirmation by clinical application. The three intermediate insulins used are :—

(1) *Globin insulin with zinc* :—(It is an insulin compound with beef globin and zinc which is in slightly acid solution rather than in suspension, as the other intermediate insulins are). It depends for its intermediate action on a combination of rapid and slow absorption due to the fact that it is partially precipitated on neutralization by tissue fluids after subcutaneous injection.

(2) *Crystalline protamine insulin* :—(NPC 50 or NPH 50) is a recrystallized form of protamine insulin containing 40 per cent as much protamine as the commercial preparation, slightly more than the commonly used 2:1 mixture (see No. 3 below). It is a neutral suspension of uniform crystals, stable enough for clinical use and fairly constant in protamine content.

(3) *Insulin and protamine zinc insulin mixtures* :—The most commonly used mixture is undoubtedly the "2:1 mixture" made extemporaneously by mixing thoroughly (in the syringe or in an empty ampoule) twice as much regular or crystalline insulin as protamine zinc insulin both in the 80 unit concentration.

The conclusions reached by them as a result of this controlled study are as under :—

Globin insulin with zinc, crystalline protamine insulin (NPC 50 or NPH 50) and a mixture of (2:1) regular insulin and protamine zinc insulin are all intermediate in rapidity, intensity and duration of action between ordinary insulin in solution and standard protamine zinc insulin. All three are superior to the ordinary insulin and protamine zinc insulin in the routine treatment of patients with severe diabetes by injection *once daily* before breakfast. The preparation which most closely fits the eating and fasting requirements of the individual patient *in the smallest dosage* should be determined and fixed in each case by trial.

Treatment of endocarditis.—Antibiotic treatment was given to 11 patients with subacute bacterial endocarditis. All patients were treated with aureomycin or chloramphenicol (chloromycetin), either initially or after other antibiotics had failed to control the infection. The dose depended on the sensitivity in vitro of the infecting organism. The average dose of aureomycin was 0·5 to 1 gm., and of chloramphenicol 1 gm., both given orally every six hours. In two patients who could not tolerate the oral route aureomycin was administered intravenously. In three patients, treatment with chloramphenicol was initiated with a priming dose of 1 gm. every hour for four doses. The duration of treatment, which varied with each patient, was from eight to 35 days. In two of eight patients treated with aureomycin, the infection was considered to have been controlled by this drug. In both patients the blood cultures became negative on the day following the institution of therapy. The infecting organisms in both patients were very sensitive strains of Streptococcus viridans. In these two patients the follow-up period was 11 and 12 mo. and there was no relapse. Aureomycin failed in the remaining six patients, in three of whom Str. fæcalis was the infecting organism. Two of these patients were subsequently cured by large doses of penicillin. Chloramphenicol was used in five patients. A definite cure was effected in only one patient. Blood cultures became negative within 24 hr. after institution of therapy, which

lasted 35 days. This patient was followed for five months after discontinuation of the drug, and there was no evidence of relapse. All patients treated with aureomycin had gastrointestinal symptoms, including anorexia, nausea, vomiting, or diarrhœa. In general, chloramphenicol was more readily tolerated than aureomycin. Only one patient complained of nausea, and in two a mild maculopapular rash developed. Aureomycin and chloramphenicol may effect a bacteriologic cure in certain cases of subacute bacterial endocarditis due to a sensitive organism. An organism found to be sensitive to aureomycin and chloramphenicol in vitro will not necessarily respond in vivo. In the small series of patients reported on, aureomycin and chloromycetin were not effective when penicillin had previously failed, but penicillin was effective when these antibiotics did not control the infection. Patients had better symptomatic results with penicillin. Results indicate that penicillin is the antibiotic of choice in the therapy of subacute bacterial endocarditis due to Str. viridans and Str. fæcalis. If large doses of penicillin or the combination of penicillin and streptomycin prove ineffective, aureomycin or chloramphenicol should be tried if in vitro studies are favorable.—(*Journal of the American Medical Association*).

Chemotherapy in cholera.—*Br. Med. Jour.*, 10-3-31, pp. 500–504, and editorial.

Dr. S.C. Lahiri of the National Medical Institute of India, records the result of his carefully controlled observations of 317 cases of cholera from May to July 1950, using sulphaguanidine, formosulphothiazole, and formosulphacetamide. The cases were those admitted to the cholera ward of the Chittaranjan Hospital, Calcutta, during the epidemic of 1950. The three drugs were given orally to successive patients in cyclic order according to their admission into the ward, the fourth one admitted received no chemotherapeutic drug and served as control. The dosage was the same for all three drugs. 4 g. initially followed by 2 g. every 4 hours, throughout day and night, till symptoms subsided or stool became vibrio free—children received proportionately lower doses. All patients received saline transfusion (hypertonic, isotonic and alkaline) till then sp. gr. of blood came to normal level. Atropine sulphate 1/100 grain hypodermically was given on admission to adults and repeated after 12 hours if necessary. All received glucose intravenously either in 25% solution (50 c.c. every 8 hours) or with normal saline in 5% solution as transfusion.

Results :—The effects of the three drugs (in the order given above) and of the control were studied in 72, 64, 61 and 71 patients respectively; the respective case mortality rates being 31%, 34%, 34%, and 18%. The three drugs given orally did not reduce the mortality rate in cholera patients and the results in these cases compared unfavourably with those in cases where no chemotherapy was given. These results of Dr. Lahiri are quite different to those obtained by Dr. Bhatnagar, who used a chemotherapeutic drug—a molecular combination of sulphathiazole and formaldehyde—and reported 82 recoveries among 85 patients 57 of whom were semicomatose with imperceptible pulse anuria and marked dehydration. Chopra's experience with sulphanilylguanidine in cholera was also in favour of the drug (with a mortality rate of 5·5% against 6·9% among controls).

Lahiri has shown now that chemotherapy does not materially accelerate the disappearance of the cholera vibrios, whereas it may be detrimental to the patient in other ways. Chemotherapy in the treatment of cholera is not therefore recommended in preference to the time honoured saline injections and transfusions.

Relief of prickly heat with vitamin C.—(*J.A.M.A.*, 145, 3, 1951, p. 175).

Stern records his experience of treating severe cases of prickly heat with large doses of vitamin C successfully. In none of his cases was there evidence of clinical ascorbic acid deficiency. 300–500 mg. daily of crystalline vitamin C in tablet form gave dramatic relief to nearly all the patients. The itching cleared and the rash subsided usually

within half an hour, and the effects lasted from six to 24 hours. During the summer of 1950, Dr. Ralph E. Pawley and Dr. C. A. Berry of California administered 500 mg. a day orally to adults and 100 mg. to infants, who suffered severely from prickly heat in a desert region. Itching was promptly relieved and the rash cleared. None of these patients exhibited any signs of clinical vitamin C deficiency. [As no mention of this use of vitamin C could be found in the literature, this note by Dr. Robert, L. Stern of Beverley Hills, California, is of real therapeutic importance.

Air travel and the cardiac patient.—(*Amer. Heart. Jour.*, 40, 363-9, 1951). According to Dr. S. H. May of St. Louis, physiological, experimental and empirical data exist, that suggest the existence of a factor in the human body which increases the tolerance to oxygen want in the aged and in those with cardiac disease. He presents three case histories to illustrate that patients with heart ailments tolerate air travel quite well and that there can be no valid objection to travel in modern air vehicles for patients with heart disease. May's arguments are:—The altered adjustor mechanism of the carotid and aortic nerve structures almost certainly plays an important role in the emergency of oxygen want. Some of the mechanisms which participate in the adjustment of the body to high altitude, besides the well known acclimatization by polycythemia to altitude, are increased cardiac output and vital capacity, a slight shift of the pH of the blood and an *increased* capacity of the blood to fix and utilise oxygen. There is also evidence that the coronary vessels dilate. The collective experience of the Air Lines as well as the results of the crucial experiments of air evacuation of the sick and wounded from combat zones to base hospitals during the last war corroborate May's views.

Chloramphenicol in trachoma.—(*Am. Jour. Trop. Med.*, 30, 677-683, 1950).—Pijoan and his co-workers report on their successful use of chloromycetin in trachoma characterized by acute onset of conj. inflammation, dense infiltration and papillary hypertrophy. 8 children and 6 adults were treated. The antibiotic was administered orally 3 gm. being given in divided doses at 3 hourly intervals for first 24 hours after which 250 mg. were given every 3 hours for at least 4 days. Considerable improvement (photophobia and lacrimation greatly reduced) resulted in 24 hours. In the next 4 days there was an 85% improvement in opacities and inflammation. Eyes were protected from dust and wind. The authors followed up the cases for 3 months and no relapse was found in any case.

The neurotoxic effects of dihydrostreptomycin.—(*Med. Jour. Australia*, Vol. I, No. 5, 1951, p. 199).—Dihydrostreptomycin (produced by the catalytic hydrogenation of streptomycin) was introduced as a substitute for streptomycin in the hope that the well known neurotoxic effects of that drug may be avoided. It has however been found that this new drug is not entirely free of neurotoxicity and that its use may be followed by impairment of the vestibular function, deafness or both. Carr *et al* of the Mayo Clinic (*J.A.M.A.*, 5-8-1950) have reviewed all the cases treated with dihydrostreptomycin which was followed by neurotoxic changes. They present case histories of ten patients and point out that in nine of the ten cases the data suggest that the neurotoxic reactions were attributable to the presence of too great a concentration of dihydrostreptomycin in the blood rather than to any idiosyncrasy to the drug; the maximal concentration attained was greater than 60 microgrammes per cc. Carr *et al* found that one gramme of dihydrostreptomycin given every 12 hours is a safe dose for an adult who weighs 50 to 70 kilogrammes and whose renal function is normal. They also found that the maximal concentration of dihydrostreptomycin in the blood serum was not always directly proportional to the daily dose per kg. of body weight and that the total daily dose need not therefore be absolutely proportional to the body weight. From the available evidence admittedly still incomplete there is no reason to differentiate between the 2 drugs in their therapeutic efficiency or in their effect in the auditory function of the eighth nerve; there is equal danger with both drugs in the presence of impaired renal function. *The important point* that appears to be accepted in present experience and evidence is that larger doses of dihydrostreptomycin may be given than of streptomycin with less risk of toxic effects on the vestibular function of the eighth cranial nerve.

Aureomycin and chloramphenicol in Herpes Zoster.—Forty-four patients with herpes zoster were divided for treatment in four groups of 11 patients each. The first group of patients served as controls and was given dextrose. The second group was given 2 gm. of aureomycin daily for six days. The third group received 4 gm. of aureomycin daily for 4 days. The fourth group was given 2 gm. of chloramphenicol (chloromycetin) daily for six days. The controls were selected at random, and the observers did not know which patients were in this group. No significant difference was found between the groups in respect to amount and duration of herpetic pain, paresthesias, or the appearance of new herpetic lesions. Treatment with either aureomycin or chloramphenicol within the first week of the rash shortened the pustular stage so that desquamation was earlier and scarring less. All the patients treated with aureomycin and all but two of those treated with chloramphenicol were free from secondary infection, which was present

in all the controls. The effect of the antibiotics thus can reasonably be attributed to their action on the secondary infection. Two patients with dramatic amelioration of symptoms have been reported on in detail; one was treated with aureomycin, and the other was a control. In view of these results, it seems that such expensive drugs should be employed only in very severe cases, particularly ophthalmic zoster, occurring in elderly or debilitated patients.—(*Journal of the American Medical Association*).

Effects of parenteral quinidine administration—(*Arch. Internat. Med. A.M.A.*, 86, 917–934, 1951).

Blinder and his co-workers studied the effects of Quinidine lactate administered parenterally on 59 subjects, divided into 3 groups; 22 with normal hearts, 22 with cardiac arrhythmias and 15 with abnormal hearts (with regular sinus rhythm). Special note was made of all manifestations of clinical toxicity accompanying the injection of quinidine lactate. 0·65 gm of quinidine lactate was administered parenterally to 37 subjects with regular sinus rhythm. 15 with known cardiac disease and 15 normal persons received the drug intramuscularly; 7 with normal hearts were given the drug intravenously.

The maximal cardiac response to a single intramuscular dose of 0·65 gm. of quinidine is obtained in ½ to one hour and maintained at least 4 hours. It is no more toxic than quinidine given orally in similar doses. The duration of peak effect is between 2 to 4 hours in normal hearts and at least 6 hours in those with abnormal hearts. At 24 hours a small but significant quinidine effect persists. Of the 22 subjects with cardiac arrhythmias 15 were restored to regular sinus rhythm by single or multiple parenteral doses of quinidine. Their observations suggest the following time schedule for intramuscular administration of quinidine:—when rapid therapeutic effect is important hourly administration is indicated; when necessity for speed in therapeutic response is less urgent the administration should be at intervals of 3 to 4 hours. The maximal effect of oral administration of quinidine in auricular fibrillation occurs usually between 2 to 4 hours (*Am. Heart Jour.*, 35, 1948), whereas by the intramuscular route the maximal response occurred in between ½ to 1 hour in their patients with auricular fibrillation, auricular flutter, supraventricular tachycardia and ventricular tachycardia.

Action of caffeine on hypertension—(*Dents. Med. Wosch*, 75, p. 1067, 1950).—(From Author's Summary).

Caffeine is usually considered to be able to produce a general vasoconstriction and an increase in blood pressure. It however produces vasodilatation in the brain, heart and kidneys. Sebok of Stuttgart conducted controlled experiments to ascertain whether the hypertensive effect of caffeine was sufficiently great to merit the withholding of that drug and of coffee from patients with hypertension. He administered 0·05 to 0·1 gm. (¾ to 1½ grains) of caffeine to 31 patients with pronounced hypertension and found their systolic and diastolic blood pressures were lowered. The fall amounted to from 10 to 80 mm. of Hg. in the systolic pressure. Maximal decrease usually occurred from 40 to 50 minutes after the administration of the caffeine. In 21 of these patients the pressure did not return to the initial values two hours later.

Control subjects with normal B.P. showed, on administration of the same doses of caffeine, either a slight elevation in pressure or a reduction as in the hypertensive subjects.

These investigations and the fact that caffeine dilates the coronary vessels thereby improving the metabolism of the myocardium suggest that there is *no justification* for interdicting the use of either caffeine or coffee by patients with hypertension.

Renal phosphatic calculi.—(*J A M A.*, 144, 1950).—The treatment usually employed in the management of phosphatic calculi is the acidification of the urine by means of acid ash diets, or acidifying agents. A new therapeutic regimen has been tried and found successful by Shore and Carter. 22 patients were given aluminium hydroxide gels along with a diet containing 1200 to 1300 mg. phosphorus and about 700 mg. calcium per day. The rationale for this regimen is "the formation of insoluble aluminium phosphatic salts in the intestinal tract and the corresponding reduction in the amount of phosphorus available for absorption."

Chloromycetin in ocular infections.—(*Arch. Ophthal., A.M.A.*, 45, (Jan. 1951).—Chloramphenicol solution (2·5 mg. per cc. strength) has been found very successful in the local therapy of a variety of forms of conjunctivitis and dacryocystitis. Systematically and locally administered it was useful in keratitis but not in uveitis. Intraocular infections cleared up with its use in 3 cases. 15 patients with herpes zoster ophthalmucus did well with chloromycetin systemically. It was found to penetrate into the intraocular fluid of the eyes.

Treatment of bacillary dysentery.—(*Lancet*, 259, 1950, p. 865).—Sulphonamides have been used since 1940. Sulphaguanidine and succinylsulphathiazole both relatively poorly absorbed, were the drugs of choice at first. In 1948 Hardy proved that sulphadiazine, being more readily absorbed, was the most effective against shiga infection. Sonne dysentery also yielded well to the sulphonamides; unfortunately treatment of dysentery with sulphonamides was not quite straightforward. In some infants and children, dehydration may have so far advanced that sulphonamides may prove dangerous, until dehydration has been corrected. Occasionally severe hypersensitivity, specific idiosyncrasy to sulpha drugs may bar their use. In such

cases and also where sulphonamides fail, recent clinical trials by Mazuraky (*J. Paediat*, 1950) and Ross *et al* (*J.A.M.A.* 1950) have shown that chloromycetin by mouth yields as good if not even better results than sulphonamides or streptomycin.

Limitations to modern diagnostic aids—(Foot-note in *Br. Med. Jour.*, 3-3-1951, p 456.)

Recent contributions to the Scandinavian medical press give expression to a quite lively dissatisfaction with the multiplicity, complexity, and cost of laboratory and other tests now in vogue in many hospitals. Dr. Lennart Norrlin of Stockholm, in Svenska Lokartidningden of 8-12-1950, p. 2343, (the organ of the Swedish Medical Association) has nothing good to say of radiological examinations in cases of acute gastric or duodenal perforation. He refers to cases in which a radiologist's report has induced him to undertake an exploratory laparotomy, though its hopelessness has seemed obvious to him from the outset. Proper exercise of the five senses is, in his opinion, to be preferred to laboratory reports; and the hospital chief who delays his first attendance on a newly admitted case by several days in order to equip himself with a handful of laboratory reports is *no model for his juniors*. Referring to the prodigality with which radiologists dispense their skiagrams, Dr. Norrlin mentions a case in which a relatively simple fracture of the leg below the knee was illustrated by 17 skiagrams of which 15 were superfluous. In a more general approach to the subject Dr Ole Jacob Broch of the Oslo General Hospital in Tedskuft for den Norske Lægeforening, of 15-11-1950, page 724, queries the usefulness of many of the fashionable radiological and laboratory tests. He points out that in elderly folk there are always radiologically demonstrable changes in the spine but that to hold them responsible for all or many of the patient's symptoms, may be wide of the mark. In 1949 Rontgen diagnosis cost the health insurance funds in Oslo fully 14% of all the doctor's charges. As for electrocardiograms Dr. Broch suggests that watching the effect on a patient of walking upstairs may be much more instructive and diagnostic.

An overdose of B. C. G. vaccine—(*Rev. Tuberculo.*, March-April, 1951).

Sair and Cheve describe the sequel to the vaccination of a newly born infant with B.C.G. by a midwife who drew up the entire quantity in an ampoule of B C G. vaccine, into a syringe and injected it intramuscularly into the buttock of the baby. A large cold abscess developed in the buttock and the infant did not suffer any constitutional disturbance. The abscess was aspirated and a Seton inserted and healing occurred in eleven weeks. Later suppuration occurred in the inguinal lymph glands but this also healed up under treatment in five weeks.

Subacute combined degeneration of the spinal cord—(*Brain*, Sep. 1950).

Dr Ungley compares the effects of treatment of this condition by ordinary liver extracts with that of the red crystalline anti-pernicious anæmia factor (B_{12}). Vitamin B_{12} was found by him to be as effective as liver extract in the management of pernicious anæmia and subacute combined degeneration of the spinal cord. Ungley's work also exoludes the necessity for postulating a distinct and separate neuropoietic factor. The pure extract has no special advantage over the usual liver extract, if the latter is known *to be potent*. He suggests a weekly dosage of 40 microgrammes of Vitamin B_{12} as adequate for the first six months and then the dosage may be halved; with any signs of relapse or intercurrent infection the dosage should be increased.

Corrigenda

Page 791, Octr. 1951 issue of the 'ANTISEPTIC'. Please *read* line 20 as: "The activity of the antibiotic deteriorates rapidly in alkaline solution at the room temperature. The solution is yellowish in colour with a fluorescent tinge and a thin scum on the surface" *instead* of as published in the issue.

Page 795, Octr. 1951 issue of the 'ANTISEPTIC.' Please *read* the foot note as: "Sh. Sonne is from the stock culture" *instead* of "Sh. Shiga is from the stock culture."

In page 814, Octr. 1951 issue of the 'ANTISEPTIC' in the article "Effects of Regression and Progression of Evolution on Certain Human Structures."

Please *read* the author's name as: "Dr. B. Singh, P.C.M.S., and N. Das, M.B., B.S. (cb.), P.C.M.S., Anatomy Dept., Medical College, Amritsar" *instead* of as published.

Page 831, Octr. 1951 issue of the 'ANTISEPTIC' in the article "Some Notes on Malaria" please *read in line* 35, Resochin *instead* of Resorcin.

Instead of Anopheles fluviales *read* Anopheles Fluviatilis.

In page 847, Oct. 1951 issue of the 'ANTISEPTIC' in the article "Paludrine Poisoning"

Please *read* line 12 as: "Introduction of a tablet" *instead* of "Introduction a tablet."

Please *read* line 17 as: "It cannot be said that the sufferer does not get relief in many instances by following such treatment and advice" *instead* of as published.

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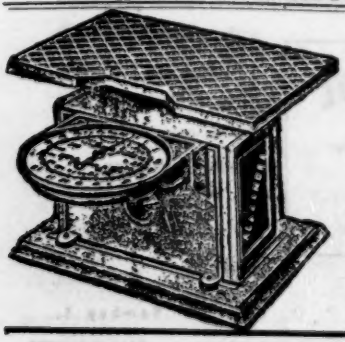

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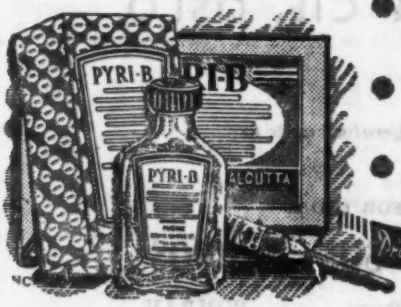

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OPIL ORIENTAL PHARMACEUTICAL INDUSTRIES LTD. OPIL
MAHIM, BOMBAY-16

ICIBEX

(Vitamin "B" Complex)
PARENTERAL

Each 2 c. c. contains:

Vitamin B_1	25·0 mgms.
Vitamin B_2	4·0 „
Vitamin B_6	1·0 „
Niacinamide	100·0 „
Cal. Pantothenate	2·0 „
Chlorbutol	10·0 „

Issued in box of 6 amps. x 2 c.c.

ICIBEX

(Vitamin "B" Complex)
TABLET

Each Tablet of 5 grs. contains:

Vitamin B_1	3 mgms.
Vitamin B_2	1 „
Vitamin B_6	0·6 „
Cal. Pantothenate	3 „
Nicotinic Acid	20 „

Issued in - 25, 100, 500, and 1000 tabs. packings.

ICIBEX

(Elixir Vitamin "B" Complex)
LIQUID

Each Fluid Drachm Represents:

Vitamin B_1 (500 I.U.)	1·5 mg.
Vitamin B_2 (Riboflavin)	1 „
Nicotinic Acid	4 „
Vitamin B_6 (Pyridoxin)	0·3 „
Pantothenic Acid	0·5 „
Sodii Glycerophosphate	50·0 „
Alcohol 17·0% proof in Sugar Free Base.	

Available in 4 oz. & 16 oz. Packings.

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BRAHMI (Special No. 1) OIL

Useful in cases of :

BALDNESS, DANDRUFF,
GREY HAIR,
FALLING OF HAIR.

The use of the oil :

IMPARTS SOUND SLEEP &
THUS ENSURES BETTER
EYESIGHT AND MEMORY.

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Send M.O. for Rs. 5-5 for Big Bottle and Rs. 3-7. for Small Bottle (including postage and packing charges) as no V.P. is sent.

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Lepetit Specialities for Tuberculosis.

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STREPTOPAS (Dihydrostreptomycin Tri-Para-Amino-Salicylate)
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Literature on request to:

BIDDLE SAWYER & CO. (INDIA) LTD.
25, Dalal Street, Bombay-1. G.P.O. Box 887, Calcutta.

100 Tablets
TEBEKAR
B
NEW THERAPEUTIC AGENT TO COMBAT TUBERCULOSIS
TEBEKAR
T. B. I. + CHLOROTHENE CITRATE T. B. I.
FOUR MAIN QUALITIES
POWERFUL THERAPEUTIC AGENT AGAINST KOCH'S BACILLUS.
EXTREMELY WELL TOLERATED. THE CHLOROTHENE CITRATE GUARDS AGAINST ANY ALLERGIC DISORDERS WHICH MAY BE CAUSED BY THE T. B. I.
SMALL COST
REDUCED DOSAGE
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JUGGAT SINGH'S SON & BROS
MARINE DRIVE, BOMBAY
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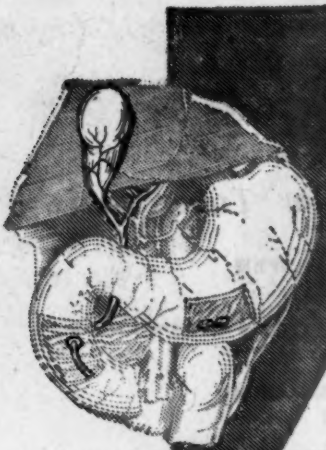


BILE DEFICIENCY

HEXACHOL stimulates the activity of the liver, promotes the secretion and flow of bile. Has antiputrefactive and antiseptic action, establishes drainage of the biliary tract, aids emulsification and absorption of fats, prevents formation of cholesterol and biliary calculi, increases peristalsis of stomach and intestines.

HEXACHOL is beneficial in all cases of irritation, inflammation and infection of the biliary tract and in conditions of biliary insufficiency.

HEXACHOL

CIPLA

COMPOSITION:

Cholic Acid	...	0.075 G.
Hexamine	...	0.225 G.
Inositol	...	5 mg.

NEOCHOLIN

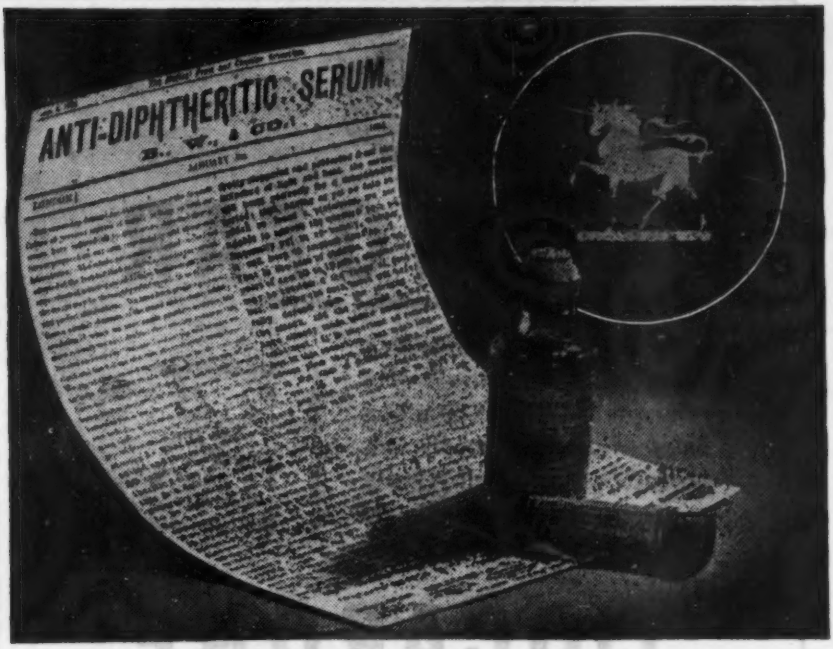
CIPLA

EACH TABLET CONTAINS 0.25 G. DEHYDROCHOLIC ACID.

Cipla LABORATORIES BOMBAY-8.

LITERATURE SENT ON REQUEST.

Cipla Sales Depot, 1/186, Mount Road, Madras.



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Leadership

IN 1894, *the year of Roux's classical paper on the serum treatment of diphtheria, The Wellcome Research Laboratories were founded and produced the first commercially issued antitoxins. This, the initial step on a path of ceaseless research, led to the special process of serum refinement and concentration evolved in* 1939 *by workers in these Laboratories.*

TODAY, this process is universally recognised as *the* method for preparing antitoxic sera. The final product, consisting of a solution of enzyme-refined globulins, contains the minimum amount of non-specific protein. All 'Wellcome' antitoxic sera for human use are made by this process. In addition they are subjected to exhaustive tests for potency and purity before issue. The following 'WELLCOME' brand ANTITOXIC SERA are available: DIPHTHERIA ANTITOXIN, GAS GANGRENE ANTITOXIN (perfringens), MIXED GAS GANGRENE ANTITOXIN, TETANUS ANTITOXIN.

'WELLCOME' REFINED ANTITOXIC SERA

PREPARED AT THE WELLCOME RESEARCH LABORATORIES, BECKENHAM, ENGLAND

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AMINOPAR

(Sodium Paraamino Salicylate)

The introduction of AMINOPAR manufactured by the world renowned Union Chimique Belge ensures the supply of a product which is guaranteed to be of the finest possible quality at the minimum rate.

GRANULES
66% P.A.S. Chocolate brown. In tins of 100 gms.
TABLETS
0.5 gm. Chocolate brown. Bots. of 1000 and 100 tablets.

TIOCARONE

(Thiosemicarbazone)

Limited supplies in the following packing are available:
Bottles of 1000 tablets.
Bottles of 150 tablets.

is a recently developed synthetic product known chemically as Para-acetylaminobenzaldehyde Thiosemicarbazone. It shows a powerful action against Koch's bacillus both in vivo and in vitro, and clinical results obtained with it are most promising. TIOCARONE can be used in conjunction with Dihydrostreptomycin or P.A.S., and it is reported that this association improves the activity of each drug separately.

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G. P. O. Box 887, Calcutta 1

For

MANIA—HYSTERIA—SCHIZOPHRENIA—
ANXIETY NEUROSIS—MELANCHOLIA.....

℞/- *Tablet* **SILEDIN**

(SOME CLINICAL FINDINGS)

Case 1. MANIA Care of Dr.....MD.

Sex–female Age-40. **Complaints:** Loss of temper-maniacal outbursts-loss of appetite. **Clinical Symptoms:** Insomnia, mania, rolling, abstinance of food, hostile attitude to every body particularly towards her daughter-in-law and mother-symptoms more marked in the presence of her husband. **Previous Treatment:** treated with Oestrogenic hormones and Phenobarbitons. **TREATMENT WITH SILEDIN:** Only **SILEDIN** has been given with good results. **Special Remarks:** Epilepsy and Hysterical element for many years.

Case 2. **ADOLESCENT INSANITY-SCHIZOPHRENIA** Care of Dr.....MBBS.

Female, Age 30. **Occupation:** Home work. **Complaints:** (i) Somebody will take away my ornaments to sell them away (ii) I wish that my brothers and father should be ruined (iii) Somebody is going to break my house etc. **Clinical Symptoms:** (i) To sit silently and idle not to do any work (ii) no proper sleep (iii) a look of dum-idiot (iv) nothing abnormal was detected on physical exam-patient is a sterile–married life of 16 years. **Previous Treatments:** Nicotinic acid and injections and tablets in large doses for three weeks-no remarkable results. **Treatment with SILEDIN:** One tablet three times a day was given-with one bottle of fifty the mental condition was completely improved without leaving any trace of the former disorders–In all 100 tablets are given-patient has put up good amount of weight-looks very healthy and mentally-perfectly all right.

Case 3. **ANXIETY NEUROSIS** Care of Dr.....LCPS. DPS. LM.

Sex: Female, Age 42–**Occupation:** Household work. **Complaints:** Afraid to come out of bed-thinks she is very weak-at times irrelevant in talk-anxious look. **Clinical Symptoms:** Anxiety Neurosis. **Other Reports:** General debility-poor nourishment. **Treatment with SILEDIN:** 2 tabs. twice a day for one month. **Remarks:** After four days treatment the facial look of anxiousness improved-after a week complete improvement. Treatment was however continued for one month.

Case 4. **SCHIZOPHRENIA** Care of Dr.....LCPS.

Occupation: Male nurse in mental hospital. **Complaints:** Insomnia-fear as if Police is following-nearest and dearest appeared as enemies-suspicious as if he would be poisoned-blankness in head. **Clinical Symptoms:** Vacant face-dyspepsia–tender hepatic region. **Previous Treatments:** Electric shock Therapy-temporary improvements.

Treatment with SILEDIN: Has been taking **SILEDIN and LEPTADEN** for the last one month with definite improvement–no other treatment prescribed. **Remarks:** The patient says "there is great relief after taking medicine. I am taking regularly for the last 15 days. I am getting very good sleep. Indigestion is cured and get regular motions. Head remains very calm." After about two months he says: "I am feeling complete relief by the treatment".

PACKINGS

SILEDIN: 50, 100, 500, Tablets. **LEPTADEN:** 56, 112, 500 Tablets

Literature from:—

ALARSIN PHARMACEUTICALS (INDIA)

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PARAMISAN SODIUM • PRICE REDUCTION → PARAMISAN SODIUM • PRICE REDUCTION → PARAMISAN SODIUM • PRICE REDUCTION →

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Albert David delivers you the goods—the first in India to introduce the following :—

Para-acetyl-aminobenzaldehyde Thiosemicarbazone—

SIOCARBAZONE.

A combination of Vitamin B_{12} with Crude Liver Extract—

SIOTRAT FORTE.

Water Dispersed Solution of 100,000 I.U. of Vitamin A—

VITAMIN A 'Albert David'.

Salicylamide with Vitamin C for Rheumatic and Rheumatoid affections.

CALCIUM PAS

Diiodo-hydroxyquinoline–SIODOENTERIN.

.....

AND NOW

(INTRAVENOUS IRON) for secondary anæmia.

(METHIONINE AND CHOLIN SYRUP) for infantile liver, Cirrhosis of the liver and sluggish liver.

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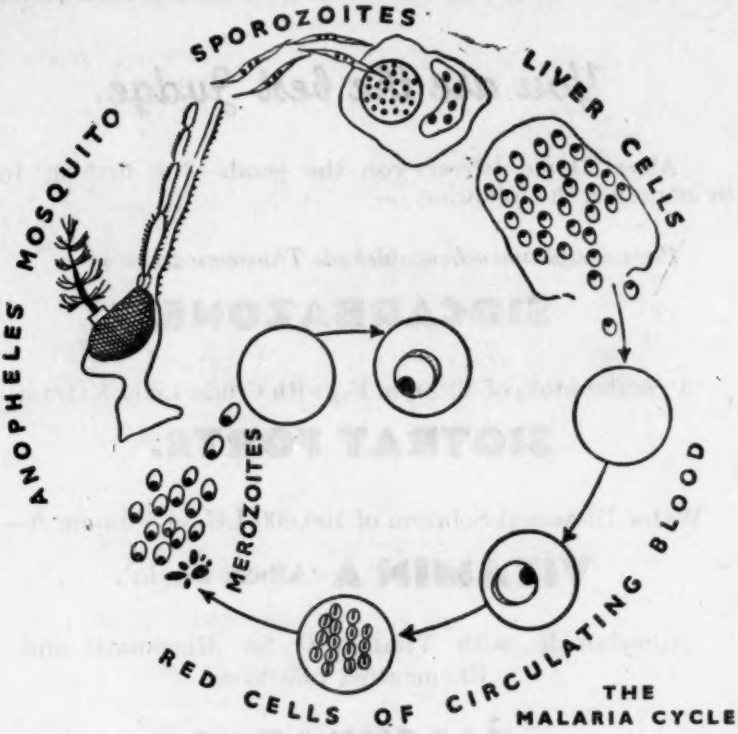

Quinine acts on the blood stages in the life-cycle of the malarial parasite and in spite of recent advances in chemotherapy remains a standard remedy in the treatment of malaria.

HOWARDS OF ILFORD

Makers of Quinine Salts since 1823

HOWARDS & SONS LTD · ILFORD NEAR LONDON

Telegrams: "CREOSOTH"

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Princess Street, Bombay-2.

On orders upto Rs. 200-0 a Plastic Purse with Diary will be sent free

Terms:—By V.P.P. or Bank. 25% advance from New Clients

Proflavin (Acriflavin) 500grms. 32-8 25grms. 2-12
Dihydro Strepto. Pfizer, 3-12; Merck 3-3
„ P.D. 3-4; Upjohn 3-3; Cheap 2-14
Combiotic Pf. 8-8
Penicillin G. Sodium :—

1	2	5	10 lacs.
0-12	0-13	1-6	2-8 Merck.
0-14	0-14	1-8	2-9 Pfizer.

„ Procain Pf. 3 x 1cc 2-12; 4x1 cc 3-0 Merck 2-14
„ „ Oil 3 lacs x 10 cc. Pf. 11 Merck 10-0
„ „ B.W. 3 lacs x 1cc 1-12; 4lacs x 1cc. 2-4
Penicillin Tab. Pf. ½ lac.x12 4-8; 1 lac.x12 9-8
„ Eye Oint 8-0; Skin 13-8; Lozengies 13-8 dz.
Aureomycin 8 Caps. 21-0 [Lozengies 500 11-8
Chloromycetin 12 28-12; Terramycin 16 38-8
Quinine Bengal 48-8; Java 57-0 Howds 58-0 lb.
„ oz. Ind. 4-0; Howds 5-0; Bihydro oz. 8-8
Quinine Bihydro Amps. 100 x 10 grs. x 2cc.

Ind.	Alb.	B.D.H.	Evans	B.W.	P.D.
19-0	33-0	31-0	28-0	35-0	48-8

„ 100 x 5 grs x 1 cc. Ind. 14-0 BDH. 24-0
Pamaquinine Tab. 300 1-2 [6½ Gr. BI. 14-0
Qu. Amps. Italy 15grs. x5x2cc. 1-2; 100 amps 20-0
„ „ 2 grs x 100 3-4 5 gr. x 100 B.W. 6-4
„ „ 5 gr x 1000 BDH 42-0 Howds 1400 60-0
„ Sulphate Java 3½ gr. x 500 20-0; USA 5 gr.
„ Bihydro 2gr. x 100 4-4; 5gr. 7-8; [1000 38-0
Eue Quinine Holland or Java 4-2 Roche 4-6

P.A.S. 100 grms.	Italy	Bayer	Dumex	Herts
	6-0	12-8	14-8	12-12
„ 100 Tabs.	4-8	8-8		11-10
„ 250 „	11-12;	500 21-0	Italy	

Atebrin Whinthrop 1000 12-0; 100 1-8
„ Bayer 15 10-4 dz. 300 9-12; Bot. 1000 19-0
„ Amps. 1 grm. x 5 3-12; 50 amps. 35-0
„ „ 0-3 grm. x 2 2-8; 25 „ 23-0
Mepacrine ICI 1000 11-8; Eng. 1000 10-0
Quinacrine MB 500 7-0 1000 11-8 USA 9-8
„ 25 x 3 grm. 26-0; Nicotinic Acid 500 4-4
Paludrin 3 grms. x500 25-12; 1000x1 grm. 27-8
„ amps. 25 11-4; 5 amps. 3-4; [GL. 6-4
U.S.A. Vit. B 12 30 M. x 10 cc 7-4; 50 M. 5cc.
GL. „ „ x 6 amps 4-12; 50 „ 6 amps 7-8
M & B. 693, 500 43-0; 760 500 37-0
N.A.B 15 1-2; ·3 1-5; ·45 1-9; ·6 1-11
Acetylarson adult 7-4; Child 4-12; Neptal 6 x
BW.Sulphetrone 100 13-0; 500 55-0 [1cc.3-0; 2cc. 4-4
Solusepticin 25 amp x 5 cc. x 20% 20-0
Stovarsol Tab. 500 40-0; Sulphatriad 500 44-8
Sulphanilamide Tab. 1000 Eng. 11-0 5gr. 7-8
„ MB 500 6-8; Glaxo 1000 15-0; Pow. lb. 10-8
Sulphaguanadine Eng. or Aust. 1000 32-8
„ 500 Eng. 17-8; M.B. 24-0; ICI. 18-8
Sulphadiazine Eng. 1000 85-0; 500 AFD or BDH 48-8
ICI. Sulphamezathine 500 31-0 100 7-0
Sulphathiazole Boots 500 24-0; 1000 42-0
Sulphanilamide Cream 4 oz Lilly 5-8 doz.
Gentian Violet Jelly Lilly 4 oz. 5-8 doz.
Emetin Hydro B.W. ½ gr. x 12 9-8; 1 gr x 6 9-8
„ Endo 6x ½ gr. 2-6 B.W. ½ gr. x 100 70-0
„ P.D. ½ gr x 6 8-0 1 gr x 6 11-0
Emetin Hydr. Eng. ½gr. x 12 8-0; 1gr. x 12 13-8
Calciostelin 15 c.c. 3-8 [½gr x 25 BDH 14-8
B.W. Emetin tab. H.T. ½gr. or 1gr. 6-8; Eng. 4-8
Cibazol. tab. 250 18-0; Enterovioform 11-4 100
Berin 25 mg.x10cc. 2-8; 50 mg. 4-0; 100 mg. 6-4
P.D. Adrenalin in Oil Amp. 6 4-4
„ Antuitrin S. 18-0; Combex 10 cc. 7-12
„ Liver 2 USP. 4-11; 5 USR. 9-4
Gadusan 2 cc. 12-8; Campolan 5 x 2 cc. 6-4
B.W. Cal. Gluconate 10% x 10 c.c. x 100 45-0
Sandoz „ „ 10% 10cc. x100 110-0; 5 amp. 6-8
„ „ 10% x5cc. x10 10-12; 10 cc. x20 Amp. 22-4
Oxoid Liver Ext. 5 USP x 10 cc. each 5-0
Redoxan 6x2 cc. 5-4; 3x5cc 4-8; 25x5cc. 36-0
Vit. B_2 Roche (Beflavin) 50x10 mg. 20-0 box
Saridon tab. 10. 16-8; 250 32-8; Cytoserum 9-8
Vitamin B Tab. 500 USA, 1-8; Hæmo „ 9-8
P.D. Chemequinine 3 tabs. 2-12; Entodan 12-0
Neosalvarson 15 1-12; 3 2-6; 45 2-11; 6 3-2
Omnopon Amps. with Needles Comp. Tabs 1-0
B.W. Morphia Sulphate cum. Atropin 20x½ gr 5-0
P.D. „ „ 20x½ gr. 3-8; Ind. 2-8
Vitamin K. Amps. BW. 100 x 1 cc. 25-0
Chiniofonum Esg. (Yatrin POW.) 500 grms. 15-0
Aminophylin Tab. BW. 25 2-0; 100 6-0
„ Amps. 6 x 2 cc. 4-12; 6 x 10 cc. 6-0
Procain Hydrochlor 1% x3 cc. x 25 amp. 4-4
Distil Water 100 x 5cc. 7-0; 10 cc. 8-8; 2 cc. 5-8
Asparine Tab. 1000 Eng. 5-4; BDH. 6-8; Howd. 9-8
Epedrin Hpdr. ½ gr x 1000 Ind. 10-8; USA, 15-0
Yeast Tab. BDH 1000 7-8; Eng. 7-4
Menthol Cry. oz. 5-0; Thymol oz. 4-4
Santonine dr. 11-8; Ext. Ergot Lqd. 4 oz. 12-8
Digoxine Tab. 25 2-0; 100 5-0; 500 17-8
Phenobarbiton Tab. B.D.H. 1000 x 1 gr. 14-0
Cylotropin I.V. or I.M. 5-0; Atophynal IM. 13-8
Belladonna Plaster Eng. 6-8; JJ. doz. 11-8
Potas Chlorate Powd. lb. 4-0; Tab. Eng. 500 6-0
Woodward Grip Water doz. 30-0 SB. 15-8 doz.
Stethuscope Roche Plastic Fine 3-8 each
Hypo. Syringe (S.N. Re. 1-0 More)

All Glass Japan	2	5	10	20	30	50cc.
	0-14	1-4	1-12	2-12	5-0	7-0
„ „ Italy	1-14	2-14	3-14	7-0	9-0	11-8
„ German	1-2	1-8	2-10	4-0	6-8	9-0
„ Ideal	5-12	7-8	10-0	11-8	14-8	23-0
Record German	4-0	6-0	7-4	11-0	14-8	23-0
„ „ Comp.	7-8	9-0	11-8	—	—	—
Boston	5-12	6-4	7-4	—	—	—
„ Italy	3-8	4-12	6-8	8-8	11-4	16-8
B.D. Luer Lock	7-0	11-8	13-8	16-12	22-8	32-0
Japan „	2-12	3-12	5-0	8-0	10-8	16-0
Indian Metal case	1-4	1-12	2-4	3-0	5-4	5-8
Italian „ „	1-6	2-0	2-8	3-8	—	—
Japan „ „	2-0	3-0	4-0	—	—	10-12

Backelite case 1-8 2-12 3-0 [2-4; Japan. 2-4
Record Needle D-B. 4-8; D.B. 16 5-4; Germ.
All Glass Needle Jap. 3-0; Germ. 3-4; B.D. 10-8
Stethuscope Tubing Ord. 1-4 Plastic 2-4 yrd.
F. L. Durex Origl. 3 in a tin 5-0 PKT. 3-0 doz.
Sterlixer Nickle 6" 15-0 8" 23-0
Tooth Forceps Universal 5-0 U.S.A. 8-0
B.D. Stethuscope 21-0; Triple 38-0; Germ. 11-0
Thermometer Jap. 1-2; Germ. 1-6; USA 1-12
„ Hicks 4-12; Zeal 3-0; B.D. each 9-8; Eng. 1-10
German ERKAMETER 68-0; Baunometer 125-0
Makintosh Sup; 4-8; Cheap. yrd. 3-8
Ear or Glycerine Metal Syringe 2oz. 6-0; 4oz. 8-0
Fountain Pen Battery 4-0; Saline Apparatus
Weighing Machine Detecto 43-0 [300 cc. 9-0

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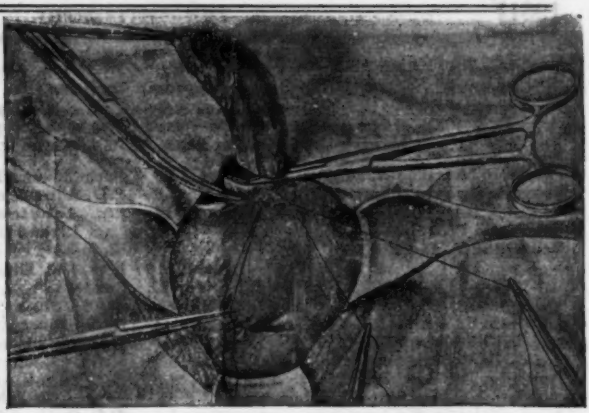
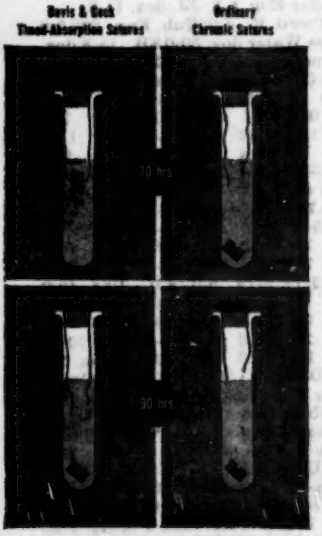


During the critical first 4 days depend on

"TIMED-ABSORPTION" CATGUT

Because "timed-absorption" catgut (surgical gut) has a *measurable* and *predictable* rate of digestion, demonstrated by extensive tests, it remains intact until the wound has gathered support of its own. Because "timed-absorption" catgut does not digest prematurely, it assures strength when needed most—during the critical first 4 days following major surgery.

Processed by an exclusive Davis & Geck method embodying accurately graded degrees of tanning, "timed-absorption" catgut has an absorption curve that parallels the changing tissue conditions of healing. Resistance to digestion is maximal during *early* repair. Later, when artificial strength is no longer required, dissolution is rapid and complete and no remnants of gut remain.



Comparison of D & G "timed-absorption" medium chromic catgut, size 0, with ordinary medium chromic size 0 catgut. Both types of catgut are suspended in a trypsin solution and weighted. Note that at the end of 30 hours D & G "timed-absorption" catgut remains intact; the weight is still held suspended up to 90 hours. Contrast with an ordinary chromic catgut suture which has begun to digest and breaks under the slight tension created by the weight at 30 hours. In human tissue all chromic sutures are digested *more slowly*, but the ratio between the two types remains the same.

D&G catgut sutures have a special matte finish. They tie readily and do not slip at the knot. Pliability is exceptional and tensile strength, diameter for diameter, is guaranteed unexcelled by any other brand. No wonder so many surgeons agree on D&G.

There is a D & G suture for every surgical purpose. Available through responsible dealers everywhere.

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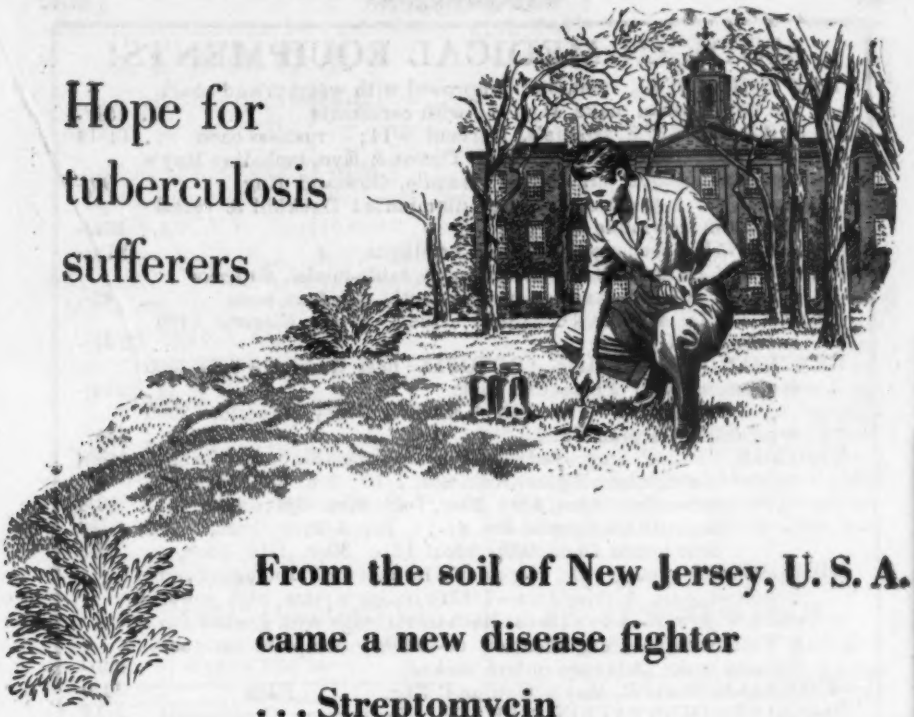
Hope for tuberculosis sufferers



In the shadow of the cloistered halls of Rutgers University a momentous medical discovery was born.

From the soil of New Jersey, U. S. A. came a new disease fighter ... Streptomycin

The fight against tuberculosis was greatly advanced the day scientists isolated from the earth a new germ-killing substance called Streptomycin. This discovery, followed by years of research with the aid of Merck & Co., Inc. chemists, microbiologists, and engineers, led to a major medical triumph — mass production of the most effective drug known for the treatment of tuberculosis.

Streptomycin now is produced in quantities large enough to treat many thousands of sufferers ... and at a fraction of its original cost. Since 1946, especially dramatic progress has been made in the reduction of the tuberculosis death rate.

Streptomycin is one more triumph of medical science in the relentless fight on many fronts against disease. Vitamins for better nutrition and health, and hormones, such as Cortisone, are further milestones in a continuous Merck & Co., Inc. research and production program to help the physician bring better health and longer life to mankind.

CORTONE
(Merck & Co., Inc. trade-mark name for Cortisone)
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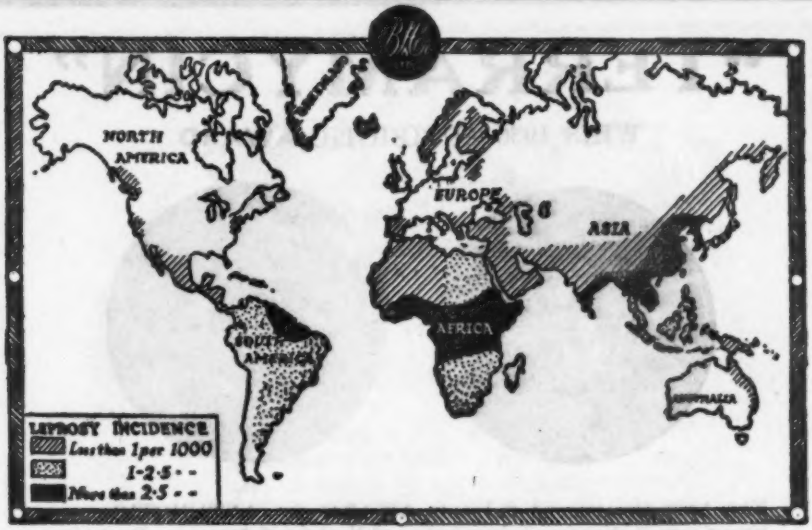

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Maclean Tooth Paste Giant doz. 18-0
Nicotannic Acid 0·5gm. 500 tabs. tin. 4-8
Oral Speculam Set of 3 set 7-8
Paludrin 1gm. 1000 tab. 27-8; 500 tab. 3gm. ,, 26-0
Pamaquin 0·1 gm. 500 or 0·2 gm. 300 tabs bot. 1-2
Personal Weighing Machine Detecto each 42-8
P.D. Chloromycetin 12 Caps. bot. 29-12
,, Benadryl 50 cap. 6-0 ; Syrup 4 oz. bot. 3-8
,, Benadryl 10 cc. 6-6; Combex 10 cc. vial 7-0
,, Liver Ext. 2 USP 10cc. 4-8; 5 USP 10cc. ,, 8-12
,, Emetin Hydro ½gr x 1cc 6 amps box. 7-0
,, Dinaltin Sodium 100 caps bot. 6-0
,, Ferradol 2½ lb. 14-12; 1 lb. U.S.A. bot. 7-8
Penicillin Eye Oint. 0-11; Skin oint. tube 1-2
Penicillin Sodium Crys. G. :—

Merck's	1 lac.	2 lac.	5 lac.	10 lac.
	0-12	0-13	1-8	2-10 vial.
Pfizer's		0-15	1-8	2-10 ,,

Procaine Penicillin Aqueous :—
Pfizer's 4 lac. 1 cc. 3 lac. 1 cc.
3-0 2-12 vial
Quinacris USA 100 1-0; 1000 tab. USA bot. 10-4
Quinine Sulph Govt. B.P. 48-8; Std. lb. 42-8
,, ,, Roche 68-0; Java 58-0; How,, 60-0
,, ,, Ind. 4-0; How 6-0; Bihydro oz. 9-4
,, Bihydro How 2 gr. 100 bot. 4-0
,, ,, ,, 5 gr. 100 tab. ,, 8-0
,, ,, Italy 15 gr. 2c.c. 5 amps. box 1-0
,, ,, B.W. 10 gr. 12x2 c.c. 4-10; Evans,, 4-4
,, ,, 5 gr. 1cc. 6 amps. B.D.H. ,, 1-14
,, ,, 5 gr. 1cc. 100 ,, B.D.H. ,, 24-0
Quinine Bihydro 10 gr. 2cc. 100 amps :—

B.D.H.	Evans	B.W.	P.D.	Ind.
Rs. 30-0 ;	26-8 ;	36-0 ;	51-0	19-8 box

Rubber Gloves "7½" or "8" USA per pair 1-0
Saline 100 tab. 1-8; D.A.D.P.S. 50 mgm. 100 tab. 1-4
Saline Apparatus 300 cc. 8-0; 500 c.c. each 11-0
Scissors 5" 2-0; Scalpel 5" ,, 1-12
Sulphadiazine 25 3-0 ; 500 tab. bot. 48-0
Sulphanilamide U.S.A. 5gr. 1000 tab. ,, 7-4
,, Eng. 7½ gr. 1000 12-0; 500,, ,, 6-8
Sulphathiazole Boots 500 tabs. tin 23-8
Suture Needles 0-4 ; Saline Needle each 1-14
Spatula Bolus 4" 0-14; 5" 1-2; 6" each 1-4
Spirit Lamp Glass 2 oz. 1-4; 4 oz. each 2-0
,, ,, Metal 2 oz. 2-12; 4 oz. each 3-12
Silk Worm Gut 1-0; Horse Hair 100 Strand each 1-12
Stomach Tube with Ball & Funnel U.S.A. ,, 11-8
,, ,, German ,, 10-0
Stethoscope German B.D. Type ,, 11-8
,, Rubber Tubing yd. 0-12
,, Plastic Tubing ,, 2-0
T.C.F. Whole Liver Ext. 10 cc. vial 3-0
,, ,, ,, & Vit. B. Complex 10 c.c. ,, 4-6
,, Vitamin B Complex 10 cc. 4-14
Tongue Spatula 1-8; Folding each 2-4
Tooth Forceps Universal 4-12; U.S.A. ,, 6-12
Tuberculin Syringe Ideal each 9-8
,, Syringe Japan 5-8; Insulin Syringe ,, 7-8
Wisdom Tooth Brush Adult doz. 12-0
,, ,, ,, **Junior** ,, 8-0
Yeast Eng. 100 tabs. 0-14 ; 1000 bot. 6-8

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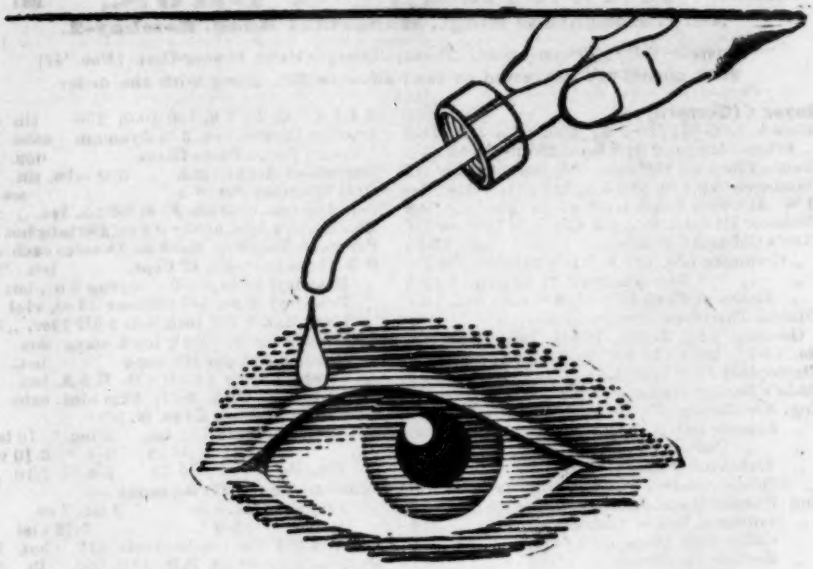

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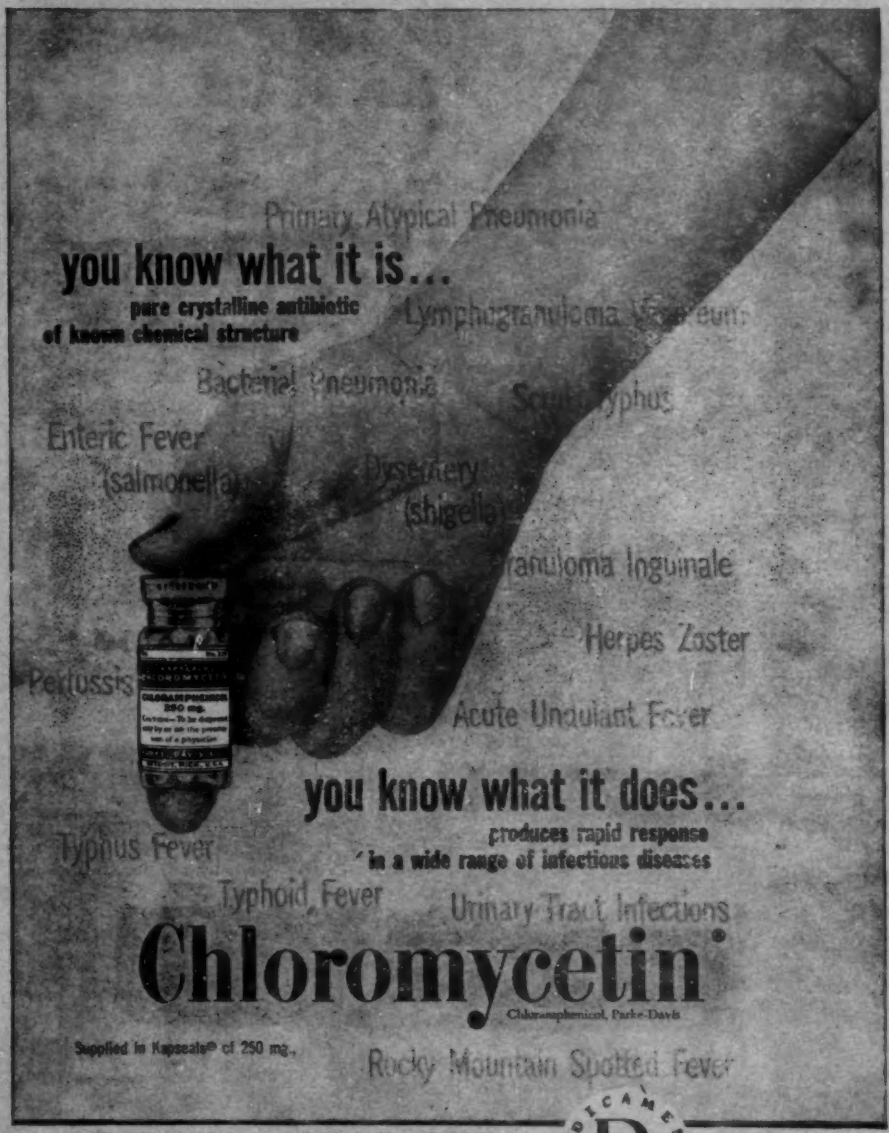

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